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No Change in Steel Bar Prices

Manufacturers Confer on the Situation

Railroad Buying Shows Improvement—Contracts for Rails and Bridges

The iron trade has at no time made more than the vaguest appraisal of its interest in the anti-trust cases and is not now trying to measure the effect of Monday's decision. It is general opinion that business should move with less restraint, with one of the commonly recognized checks upon confidence removed. However, the immediate future of the iron market is more likely to be affected by other influences. New demand having fallen much below consumption since the beginning of April, there have been signs in the past week of slightly better buying, to which the railroads have contributed a larger share than in some time.

A flurry in the bar trade has been the leading development of the week. At a meeting of the leading manufacturers of steel bars in New York on Tuesday the situation was canvassed, but the final decision was against any change in prices though a reduction was favored by one or two interests. In the conditions affecting bars one factor is the mid-year wage adjustment which involves the labor of some manufacturers. A reduction in bar prices would mean a reduction in labor in mills governed by the sliding scale.

Railroad buying is represented chiefly in rails and bridge work. New car orders have fallen off, but Canadian railroads are expected to place some equipment in this country which their home shops cannot deliver in time for the crop movement. Track supplies have been more active and at Pittsburgh light rail business has been better in the past week.

Of the Kansas City & Southern's expected order for 14,000 tons, a good part will probably be rolled at Sparrows Point and delivered by water to Texas port. The Great Northern inquiry for 28,000 tons is pending. An order for 8500 tons for the Kansas City, Mexico & Orient has been placed at Pittsburgh. The Entrerios Railway in Argentina has bought 5000 tons of 60-lb. rails which will be rolled by the Carnegie Steel Company. At Chicago the Pennsylvania Steel Company has sold 5000 tons of girder rails to the Chicago Railways.

The largest contract for railroad bridge steel was 8200 tons for the Chicago & Northwestern, divided between the Cambria Steel Company and the American Bridge Company. The latter company was low bidder on the Reading track elevation work at Philadelphia—4300 tons. At Pittsburgh three pending contracts, those for the Hotel Oliver, the new bridge at the Point and the Pittsburgh Crucible Steel Company's new plant at Midland will require more than 15,000 tons.

Plate mills have had little encouragement in recent developments. For a section of the Catskill aqueduct about 3300 tons of plates and shapes are about to

be awarded and bids have gone in on 4500 tons of plates for the Los Angeles aqueduct.

Markets in the lighter products are drifting along with little change. Wire manufacturers met in New York Tuesday and reaffirmed prices. Tin plate shipments are better than in April, while the sheet market still shows some irregularity in prices.

The pig iron situation is more unpromising. Prices in some Northern markets are weaker and spot sales of Southern iron continue to be made at \$10.50 and \$10.75 for No. 2 foundry.

Small sales of Bessemer iron are reported at less than \$15 at Valley furnace, while basic iron is on a \$13.25 basis. A sale of 6000 tons of basic was made at that price for third quarter delivery. A Canadian car works is in the market for 2500 tons of basic and 2500 tons of low phosphorus iron.

Several more merchant furnaces have gone out of blast. The Steel Corporation has increased its operations, however, one South Chicago and one Duquesne furnace having been blown in this week, making 64 per cent. of its capacity active.

Some Eastern furnaces have been in the market for coke for the second half of the year. More Connellsville ovens are blowing out in view of the declining production of pig iron.

Sales of electrolytic copper have been made at 11.90c and 11.95c., and indications increase that sound adjustment of production to consumption will only come through market prices which temporarily eliminate the higher cost properties.

Reason in Anti-Trust Cases

The business community finds encouragement in the decision of the United States Supreme Court this week in the case against the Standard Oil Company, just as it found ground for apprehension in the unanimous decision of the same case by the United States circuit court in November, 1909. Both decisions order the dissolution of the Standard Oil Company because its existence is a violation of the Sherman anti-trust act. They diverge sharply in their interpretation of the act, and in this divergence those who have so long feared for the foundations of present-day business are taking hope. The United States circuit court had caused widespread doubt as to the legality of all the large consolidations, its decision being almost in terms that a combination between competitors is a combination in restraint of trade. The country has worn out the fright immediately produced by that decision, but the ground for it will appear on quoting again one of its most significant paragraphs:

If the necessary effect of a contract, combination or conspiracy is to stifle or directly and substantially to restrict free competition in commerce among the States or with foreign nations, it is a contract, combination or conspiracy in restraint of that trade and it violates this law. The parties to it are presumed to intend the inevitable result of their acts, and neither their actual intent nor the reasonableness of the restraint imposed may withdraw it from the denunciation of the statute.

Over against this view the Supreme Court decision, as given by Chief Justice White, lays down the "rule of reason" as the guide in deciding whether the anti-trust act has been violated. In answering the Government contention that in the Freight Association case and in that against the Joint Tariff Association, the Supreme Court has held all contracts, combinations or acts in restraint of trade to be unlawful, under a literal interpretation of the Sherman law, the Chief Justice said:

If the criterion by which it is to be determined in all cases whether every contract, combination, etc., is a restraint of trade within the intentment of the law, is the direct or indirect effect of the acts involved, then of course the rule of reason becomes the idea, and the construction which we have given the statute instead of being refuted by the cases relied upon is by those cases demonstrated to be correct. This is true, because as the construction which we have deduced from the history of the act and the analysis of its text is simply that in every case where it is claimed that an act or acts are in violation of the statute, the rule of reason, in the light of the principles of law and the public policy which the act embodies, must be applied.

To put even more strongly this view of the act, the Chief Justice intimated that by refusing to apply a literal construction to it the court had saved it from condemnation as unconstitutional. It had been argued by the Standard Oil Company attorneys that the act, applied as the Government attempted to apply it, impaired rights of property and destroyed freedom of contract or trade. To this the Chief Justice makes answer:

The ultimate foundation of all these arguments is the assumption that reason may not be resorted to in interpreting and applying the statute and therefore that the statute unreasonably restricts the right to contract and unreasonably operates upon the right to acquire and hold property. As the premise is demonstrated to be unsound by the construction we have given the statute, of course the propositions which rest upon that premise need not be further noticed.

The Supreme Court has thus read into the law the distinction made in some Presidential utterances in recent years between "good trusts" and "bad trusts." The consolidations are to be judged by their fruits. The court does not supply in terms the definition of restraint of trade which the Sherman act omitted, taking the view that it was the express design of the act not to limit unduly its application by precise definition. In holding against the Standard Oil Company the court finds that its acts were "with the purpose of excluding others from the trade and thus centralizing the combination in perpetual control of the movements of petroleum and its products in the channels of interstate commerce." It is added that the court's decision was reached "by weighing the modes in which the power vested in that corporation has been exerted and the results which have arisen from it." Elsewhere it is stated that "freedom to contract is the essence of freedom from undue restraint on the right to contract," and in the case of the companies gathered together by the Standard Oil Company this freedom to contract did not exist. The company is thus judged by its acts and their effect upon trade. In so holding the Supreme Court has given definite assurance to the business world that what is done with the consolidations must be done "in the light of reason." Great organizations that have been built up without let or hindrance from the Government in the 21 years since the Sherman anti-trust act was passed are not to be attacked indiscriminately at the bidding of reckless trust smashers. That that menace has been taken out of the situation is cause for congratulation.

On the other hand, the decision gives no comfort to consolidations that have set about to defy economic laws and to use their power against the consumers of their products. There must be no mistaking the extent of popular feeling on this question. The belief that the consolidations were responsible in large part for the high cost of living, small foundation as there was for it, was at the bottom of the political revolution of last November. And under the "rule of reason" which the Supreme Court has announced there can still be many prosecutions with the same outcome as in the

Standard Oil case. It behooves the consolidations to justify the promises of public benefits which were made when they were formed. If they have divided their economies with the consumer; if they have not destroyed competitors or sought a monopoly; if they have been fair to labor; if they have given stability to the market and helped to curb advances; if they have really brought better conditions, from all standpoints, than prevailed under unrestrained competition, they need not fear judicial examination "in the light of reason."

It is to be expected that business will improve because of the decision, though the extent to which the Standard Oil case has held up enterprise has doubtless been exaggerated. Other questions having more to do with prices of commodities and labor are still unsettled. But it is something to know that the steps taken in the past 25 years in the organization of business for economical production and the elimination of some of its greatest wastes—those arising from demoralizing competition—are not to be retraced. Germany has fostered industrial combinations. Her inroads upon foreign trade, under the regime of syndicates and consolidations, have been phenomenal. It is no time for the United States, with the urgings upon our manufacturers to push into outer markets more imperative with every year, to say that they must discard modern trade machinery and go back to the hand tools of a quarter of a century ago.

The Country's Minimum Iron Requirements

The current experience of greatly reduced orders for steel products is provoking a great deal of discussion as to what are the country's minimum requirements. Experience gives some valuable indications, while it is possible to analyze conditions in some of the more important channels of consumption and obtain information.

In scrutinizing statistical records it is necessary to make allowance for the normal rate of increase, for the ups and downs in demand have not been departures from a fixed standard, but from a steadily rising standard. However bad conditions have become, the country has always taken a larger tonnage than it would have taken a few years earlier under very good conditions. Experience has established the law of doubling in pig iron every ten years so thoroughly that this principle must be considered in all analysis. The production of steel, as commonly understood—or rather misunderstood—has followed a different rule, but the familiar statistics showing successive doubling in periods much shorter than ten years; but the showing of the figures is due in large part to two incidents: the replacement of wrought iron by steel some years ago, and the appearance in the ingot statistics of steel which becomes scrap, in the various croppings of the mills, and is remelted, to appear again in the ingot statistics. In other words, while pig iron production has doubled every ten years and steel ingot production has doubled in periods much shorter, the production of rolled iron and rolled steel taken together has increased by approximately the same law as pig iron.

The leanest year in the past quarter century was 1894, with a production of 6,657,388 tons of pig iron. This was 27 per cent. less than the output in 1892, two years earlier, and nearly 28 per cent. less than the output of 1890, four years earlier, the year 1890 and 1892

having been the two years of largest production, with 1890 slightly in the lead. The 1894 production, however, was in excess of the output in any year preceding 1889. Thus there was a recession of not more than six years. In recent years the leanest was 1908, with an output of 15,936,018 tons of pig iron, which was 38 per cent. less than in the best previous year—the year immediately preceding—but a gain over any year prior to 1902, so that there was a recession of no more than seven years. A computation shows that if the normal is a doubling every ten years and two years six or seven years apart show identical production, then the earlier year showed production between 20 and 25 per cent. above the normal and the later year production between 20 and 25 per cent. below the normal. Taking this as the greatest possible departure from normal, if one year should be abnormally good by that margin and the next year abnormally bad by the same amount, a very large drop would be seen, but such juxtaposition has never occurred, and no drop as great as 40 per cent. has actually been experienced.

In the past, calendar years have been fairly representative of conditions, for as a rule fairly uniform conditions have prevailed over any single calendar year. In the recent past such was not the case, for 1909 had a very bad beginning and 1910 a very bad ending, the result being that the twelvemonth ended August 1 last was the period of maximum production, falling only 200,000 tons short of 30,000,000 tons of pig iron, or 2,500,000 tons in excess of either of the calendar years. While there was undoubtedly stocking of material at times during that twelvemonth, there is no ground for believing there were any large stocks of material on August 1 last. But taking 29,000,000 tons instead of 30,000,000 tons as the standard, a decrease of 40 per cent. would call for 17,400,000 tons. No decrease of such percentage has ever occurred, and the country has had some time to grow since then, so that experience would indicate that the very worst slump ever experienced would not bring demand as low as 20,000,000 tons, to which should be added an allowance on account of our increased facilities for exporting material. This is really the mathematical minimum, based on a repetition of past conditions. There is, however, no ground for assuming such conditions. The years 1894 and 1908 upon which this experience is based immediately followed great panics, with financial conditions extremely unsatisfactory. Now, on the other hand, is the soundness of financial conditions which causes wonder that trade conditions are as they are.

Study of individual lines of production and consumption indicate that there have been numerous cross currents in demand in the past few years. The distribution of steel tonnage last year was quite different from that of 1906 and 1907, although the total showed but a slight increase. Rails decreased, and plates probably also, while wire, sheets and tin plates showed great increases. There was a trend towards greater tonnage in the lines which are least subject to fluctuation, because their consumption is an everyday occurrence and does not depend upon the undertaking of large projects. This change in the character of consumption tends to reduce the fluctuations in tonnage from year to year. The increases in consumption of these lines are likely to continue with considerable uniformity through thick and thin.

The absence of railroad demand is usually cited as

the great cause of light buying at this time. As a matter of fact railroad orders for cars and locomotives in the past two or three months have been fairly numerous, but not spectacular as to size. On account of the steady increase in traffic and the wearing out of wooden cars, for there are hardly any wooden cars in service less than about ten years old, the railroads are coming to have normal requirements, besides their special requirements due to expansions. The freight traffic of the country doubles on an average about once in 12 years, so that roughly speaking rails and equipment are being worn out four times as fast as was the case a quarter century ago, when the heaviest railroad building was in progress and when railroad requirements were almost wholly for extensions instead of for upkeep.

Thus there is ground for a firm conviction that the irreducible minimum of the country's actual requirements, under present financial conditions, is really quite large, and much larger than is indicated by the low rate of buying of the past few weeks. This must yield eventually, and in the not distant future, to a much larger rate, or the precedents in the whole history of the iron trade will be broken.

The Iron Age Directory

The publishers of *The Iron Age* are pleased to announce that *The Iron Age Directory* for 1911 is now in press. This will be a much more complete Directory than has ever been published by this company, as it will contain the names of all the advertisers in all four of its publications. It will contain more classifications, having been laid out on a better and a more comprehensive plan than ever before.

The cost of preparing and publishing this Directory will be necessarily increased for the reasons above given. It is our purpose to furnish it to those subscribers of *The Iron Age* who have use for it and therefore desire it. We do not wish, however, to send it to people who have no need for it, and thus have it wasted. We shall therefore require that subscribers who desire to get this Directory must ask for it in order to have it sent to them. Requests should be sent in as promptly as possible, addressed to the Directory Department of *The Iron Age*, 239 West 39th street, New York City.

The previous editions of the Directory have been found to be of great value to railroad and other purchasing agents and to officials of manufacturing establishments who have a large amount of buying to do, and want to know just where to find good, live industrial concerns who are prepared to furnish things that they are in need of. We are confident that the 1911 edition will be found still more valuable.

The price of the Directory to non-subscribers will be \$2 per copy.

The Standard Scale & Supply Company, 1345-1347 Wabash avenue, Chicago, has received an order from N. M. Stark & Co., Des Moines, Iowa, for 10 Eclipse low-charging batch concrete mixers. Representatives of the buyers had spent several days at the last Chicago Cement Show inspecting the different types of concrete mixers, and after considering the merits of all the machines decided in favor of the Eclipse. The points of merit especially regarded were the low charging platform, the large open drum which permits the batch to be seen while mixing, the simplicity in construction, and the few working parts, enabling the complete outfits to be so lightly built as to be capable of easy removal from place to place.

The National Association of Manufacturers

Sixteenth Annual Convention

The sixteenth annual convention of the National Association of Manufacturers, held May 15 to 17 at the Waldorf-Astoria, New York, was attended by nearly 400 members and visitors. In connection with the convention an interesting exhibit of accident prevention devices was made in a room adjoining the convention hall, where was shown the most complete collection of photographs of safety apparatus that has ever been gathered together. Interiors of plants of more than 40 members of the association were thus shown, and photographs of accident prevention apparatus in factories of all descriptions were exhibited. The meeting on Monday was enlivened shortly before the close of the session by the announcement of the decision of the United States Supreme Court in the Gompers-Mitchell contempt case, and in that connection James A. Emery, counsel for the association, said: "I have not had the opportunity to read the opinion, but attorneys who heard it believe that on every substantial issue of principle the contentions raised by Mr. Gompers and his associates are vigorously condemned. Their escape from imprisonment is due to a technical error in procedure and not, as was contended by them, to a lack of power in the court to enjoin a boycott or punish parties who, being prohibited from prosecuting a boycott, used tongue or pen as a means of doing so and then pleaded the constitutional right to liberty of speech or of the press as a means of escaping punishment for their disobedience."

President John Kirby, Jr., presided over the deliberations of the association. On Monday afternoon an address was made by John Foster Carr, secretary of the National Liberal Immigration League, on the "New Immigrant Labor—Keep Open the Gates." Addresses were also delivered by Edmund Wetmore, ex-president of the American Bar Association, who talked on "Our Patent Laws," and by Charles M. Jarvis, who presented observations regarding the Panama Canal, based on a recent visit.

Tuesday morning's session was largely given over to the reports of the officers and committees. In the afternoon James A. Emery spoke on "How Workmen's Compensation Plans Can be Effected by Taxation." There were also addresses by M. W. Alexander, of the General Electric Company, who talked on "Accident Prevention," and Walter Drew, counsel for the National Erectors' Association, who discussed "Industrial Disputes."

The Presidential Address.

President Kirby's address was an able presentation of the work now being accomplished by the association. After paying a tribute to the members for the assistance and support given him during the year, he called attention to the growth of the association, the past year having recorded the largest yearly increase shown in a long period. Setting forth the desirability of organization and co-operation, he strongly commended the American Anti-Boycott Association, the National Council for Industrial Defense, the National Metal Trades Association and the National Founders' Association, stating that the time is at hand when all business men should no longer have to be coaxed into supporting not one only but all of them, and that the men who give freely of their time, their energies and their money in carrying on the work of such organizations should not have to plead for assistance from those who are among its beneficiaries.

He called attention to the work of the committee on industrial indemnity insurance and the investigation made in Europe by Mr. Schwedtmann, the chairman of the committee, and Mr. Emery, its general counsel, the result of which has been published in book form, making a volume which will form an epoch in industrial literature. He discussed the subject of employers' liability, expressing the opinion that gradual and not hasty exertion should be applied to the solution of the problem. With regard to industrial education, he declared that the antagonism of the National Association of Manufacturers to the principle of the closed shop and the methods employed to establish it is too strongly entrenched in the minds of its members ever to permit of any mixing up with the labor

trust in its policy with respect to industrial education. He strongly commended what is being done in establishing practical and efficient manual training or trade schools, believing that the subject should be handled by an organization formed expressly for the purpose. He again advocated a permanent tariff commission. A considerable part of his address was devoted to the condemnation of those who dynamited the building of the Times at Los Angeles, Cal., and in that connection denounced the manner in which organized labor has either supported or condoned deeds of violence.

Resolutions Adopted

At the session on Tuesday afternoon quite a number of resolutions were adopted, in each case after a full discussion of their purposes. Omitting the preambles, these resolutions were as follows:

THE LOS ANGELES DYNAMITERS.

Resolved (1), That we take this occasion to reaffirm and reiterate our full belief in the right of workingmen to organize for the betterment of their conditions, and to seek to secure that betterment by any and every means that is lawful for any organization of persons, political, religious, social or industrial to employ;

(2) That we deplore the widespread expression of class hatred and the manifest attempt to prejudice the full and fair workings of our laws and courts as a matter of more grave than sinister importance to our nation than the crime which has been the occasion thereof, though the enormity of such crime is beyond words;

(3) That we refuse to believe that such expressions are at all representative of the real thought and feeling of any considerable number of our citizens, whether within or without the ranks of organized labor, and we prefer rather to seek their source and animus among those so-called leaders of organized labor who habitually employ, countenance and believe in the use of all forms of force, coercion and intimidation in industrial disputes, and who foresee in the public indignation aroused by the carrying of the doctrine of force to its logical and awful conclusion, in the shape of dynamite, a serious check upon their own future activities;

(4) That we express our earnest desire, in common with that of every right-thinking citizen of our country that said accused persons may have a fair, impartial, and speedy trial, free from the influence of class feeling, and irrespective of any question save only that of their guilt or innocence of the crime charged, and we assure the public officers, upon whom devolves the duty of conducting said trial, of our full faith and confidence in their purpose and ability to try the accused without fear or favor.

CLASS LEGISLATION

Resolved, That the National Association of Manufacturers does herewith vehemently protest and sternly rebuke any attempt by our national or State legislatures to foster, consider or enact hasty, undigested and special legislation designed, directly or indirectly, to create class legislation, with all its attendant constitutional dangers and industrial disorders.

CRIMINAL USE OF DYNAMITE.

Resolved, That we consider the criminal use of dynamite and other explosives as a matter of grave national concern, and the employment of all the lawful agencies of government to check and prevent such use as of vital importance, and be it further

Resolved (1), That we urge upon the legislatures of the various States the passage of laws regulating the sale, transfer, storage and use of dynamite and other high explosives, to the end that the greatest measure of safety and protection to life and property from the criminal use of said explosives can be secured with as little interference as may be with the legitimate and industrial uses of the same.

(2) That we believe and therefore urge that the possession of a bomb or of a time clock contrivance, or other infernal machine accompanied by possession of dynamite or other explosive possible to be set off and exploded thereby, which bomb, contrivance or infernal machine is manifestly not suitable to or intended for any legitimate industrial use, should be made a felony, and that, in general, penalty should be provided for the criminal use of dynamite and other explosives sufficiently commensurate with the enormity of the offense to afford a deterrent effect upon said use.

(3) That we urge upon our national Congress the passage of laws upon the above lines for the District of Columbia and the territories, and also such laws as may be proper and expedient, governing, regulating, or making criminal the transportation from State to State of high explosives, bombs and infernal machines.

(4) That the president of this association be instructed to appoint a permanent committee either on its own initiative or in cooperation with other organizations, to make this resolution effective so far as may be possible.

TRIBUTE TO PRESIDENT KIRBY

Resolved, That the delegates gathered at this convention of the National Association of Manufacturers rejoice to express their appreciation and admiration for the uniform dignity, skill and courtesy with which our distinguished president, John Kirby, Jr., has presided over its deliberations.

Further Resolved, That we record the gratification for the untiring zeal, enthusiastic devotion and sustained loyalty with which he has so admirably administered the affairs of the association during the past year, and that we extend to him the assurances of the obligation we feel for his unselfish dedication of time and labor to the principles for which the association immutably stands.

The proceedings of Tuesday afternoon included addresses by Gen. Harrison Gray Otis, proprietor of the Los Angeles Times, and by Walter Drew, the counsel of the National Erectors' Association. Mr. Drew told how the members of his association, who form about 80 per cent of the structural steel builders of the country, had split with the unions five years ago and for the last three years had suffered about 80 dynamite outrages.

Reports were received from the committee on legislation regarding the legislative activities of the last year in the endeavor by unions to limit the power of injunction, and from F. C. Schwedtmann and James A. Emery, the commissioners sent to Europe by the association last year to investigate the prevention of accidents and the subject of workmen's compensation. A number of views were shown by Mr. Schwedtmann to demonstrate how the Germans safeguard their machinery.

The Manhattan Perforated Metal Company.—Christian Eidt, senior member of the Manhattan Perforated Metal Company, completed 25 years in the perforated metals line on May 17. In 1886 he began his apprenticeship with the firm of Mundt & Creter, 88-90 Walker street, at that time the only metal perforators in New York City. When this firm dissolved partnership Mr. Eidt cast his lot with the new firm of Charles Mundt & Son, at the old location, and worked his way up to shop superintendent. In 1902, with Charles Schreyer and Phillip Creter, he established the Manhattan Perforated Metal Company, locating at 237 Center street, in what is now the wholesale hardware district. Considerably improved machinery, built from the designs of the firm, enabled it to turn out the best class of work very rapidly, and its business grew steadily, extending to all parts of the world. It is of interest that Mr. Eidt started with the only perforated metal establishment in New York City, and his firm holds the same distinction at present.

White Star Oil Filter Orders.—The Pittsburgh Gage & Supply Company, Pittsburgh, has received an order from the Berwind-White Coal Mining Company, Windber, Pa., for five White Star oil filters of the duplex type. These filters are designed for use in connection with continuous oiling systems, and each has a filtering capacity of 200 gal. per day. Other contracts recently secured are as follows: Bethlehem Steel Company, South Bethlehem, Pa., one multiplex type filter, 1000 gal. per day; Republic Iron & Steel Company, Haselton, Ohio, one multiplex type filter, 500 gal. per day; Vulcan Iron Works, South Wilkes-Barre, Pa., one duplex type filter, 200 gal. per day; Minneapolis Steel & Machinery Company, Minneapolis, Minn., one duplex type filter, 200 gal. per day. A large number of orders for smaller units have also been received. New agencies for the sale of White Star oil filters and oiling systems have been established in Cleveland, Ohio; Houston, Texas; Tampa, Fla.; Nashville, Tenn.; Birmingham, Ala.; Dallas, Tex., and Augusta, Ga.

The Q. M. S. Company, Plainfield, N. J., has just issued attractive loose leaf catalogues illustrating its line of metal sawing machines, hand power travelling cranes, jib cranes, I-beam trolleys, pneumatic hoists, power hack saws, car wheel grinding machines, Stanwood car steps and pneumatic pit jacks.

The Defiance Paper Company, of which J. A. Adams is general manager, Niagara Falls, N. Y., manufacturer of wall paper, has let contracts for two additions to be made to its manufacturing plant on Second street. The new buildings are to be completed, equipped and ready for operation early the coming fall.

The Columbia Steel & Shafting Company, with works at Rankin and Carnegie, Pa., has removed its offices from Rankin to the Empire Building, Pittsburgh. The company manufactures cold drawn, turned and polished steel shafting.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.
May 17, May 10, Apr. 19, May 18,
1911. 1911. 1911. 1910.

PIG IRON, Per Gross Ton:

Foundry No. 2, standard, Philadelphia	\$15.50	\$15.50	\$15.50	\$17.00
Foundry No. 2, Valley Furnace	13.75	13.75	13.75	15.25
Foundry No. 2, Southern, Cincinnati	13.75	14.25	14.25	14.75
Foundry No. 2, Birmingham, Ala.	10.50	11.00	11.00	11.50
Foundry No. 2 local, at furnace, Chicago	15.00	15.00	15.00	17.00
Basic, delivered, eastern Pa.	14.50	15.00	15.25	16.50
Basic, Valley furnace	13.25	13.50	13.75	15.00
Bessemer, Pittsburgh	15.90	15.90	15.90	17.40
Gray forge, Pittsburgh	14.15	14.40	14.40	15.90
Lake Superior charcoal, Chicago	17.00	17.50	17.50	18.50

COKE, CONNELLSVILLE,

Per Net Ton, at oven:				
Furnace coke, prompt shipment	1.45	1.55	1.60	1.55
Furnace coke, future delivery	1.75	1.75	1.75	1.75
Foundry coke, prompt shipment	1.75	1.85	2.00	2.15
Foundry coke, future delivery	2.10	2.10	2.25	2.25

BILLETS, &c., Per Gross Ton:

Bessemer billets, Pittsburgh	23.00	23.00	23.00	32.00
Forging billets, Pittsburgh	28.00	28.00	28.00	29.00
Open hearth billets, Philadelphia	25.40	25.40	25.40	32.00
Wire rods, Pittsburgh	29.00	29.00	29.00	28.00

OLD MATERIAL, Per Gross Ton:

Iron rails, Chicago	14.75	14.00	14.50	17.50
Iron rails, Philadelphia	16.75	16.75	17.50	20.00
Car wheels, Chicago	12.75	12.75	13.25	15.50
Car wheels, Philadelphia	13.00	13.00	13.25	15.00
Heavy steel scrap, Pittsburgh	12.50	12.50	12.75	15.00
Heavy steel scrap, Chicago	10.25	10.25	11.50	13.50
Heavy steel scrap, Philadelphia	13.00	13.00	13.25	14.50

FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.30	1.32½	1.35	1.50
Common iron bars, Chicago	1.22½	1.22½	1.25	1.50
Common iron bars, Pittsburgh	1.30	1.30	1.35	1.55
Steel bars, tidewater, New York	1.56	1.56	1.56	1.61
Steel bars, Pittsburgh	1.40	1.40	1.40	1.45
Tank plates, tidewater, New York	1.56	1.56	1.56	1.66
Tank plates, Pittsburgh	1.40	1.40	1.40	1.50
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	1.30	1.30	1.30	1.50
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.35	1.60

SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh	1.80	1.80	1.80	1.80
Cut nails, Pittsburgh	1.60	1.60	1.70	1.80
Barb wire, galvanized, Pittsburgh	2.10	2.10	2.10	2.10

METALS,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.25	12.25	13.37½	13.00
Electrolytic copper, New York	12.00	12.12½	12.12½	12.75
Spelter, New York	5.50	5.50	5.50	5.30
Spelter, St. Louis	5.20	5.25	5.30	5.15
Lead, New York	4.40	4.40	4.45	4.35
Lead, St. Louis	4.25	4.25	4.30	4.20
Tin, New York	43.00	41.50	41.70	33.20
Antimony, Hallett, New York	9.00	9.00	8.75	8.12½
Tin plate, 100 lb. box, New York	\$3.94	\$3.94	\$3.94	\$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b.

Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.; New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50 c. to 1.55c., net; H-beams over 8-in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.45c., net; tees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c.

to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	\$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, \$1.55 per square. Galvanized sheets, No. 28, \$2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel		Iron	
	Black.	Galv.	Black.	Galv.
1 to 1½ in.	75	63	49	43
½ in.	79	69	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½
Butt Weld, extra strong, plain ends, card weight.				
½, ¾, 1 in.	69	59	65	55
1½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

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Plugged and Reamed.

1 to 1½, 2 to 3 in..Butt Weld { Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe. Butt or lap weld, as specified.

2, 2½ to 4 in.....Lap Weld { The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are now as follows:

	Steel.
1½ to 2½ in.....	65
2½ in.....	67½
2½ to 3½ in.....	70
3½ to 4½ in.....	72½
5 and 6 in.....	65
7 to 13 in.....	62½

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points for lengths 22 feet and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, \$29. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed \$1.60, galvanized \$1.90; carload lots, to retailers, annealed \$1.65, galvanized \$1.95. Galvanized barb wire, to jobbers, \$2.10; painted, \$1.80. Wire nails, to jobbers, \$1.80.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.									
Nos.	0 to 9	10	11	12	12½	13	14	15	16
Annealed	\$1.75	1.80	1.85	1.90	2.00	2.10	2.20	2.30	
Galvanized	2.05	2.10	2.15	2.20	2.30	2.40	2.80	2.90	

Market and Stone Wire in Bundles, Discount from Standard List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	72½ and 10
27 to 36	72½
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Pittsburgh

PARK BUILDING, May 17, 1911.—(By Telephone.)

Pig Iron.—The American Steel Foundries has bought 6000 tons of basic iron for third quarter delivery from a Valley furnace at \$13.25 at furnace. The Canadian Car & Foundry Company is inquiring for 2500 tons of basic and 2500 tons of low phosphorus iron, but the business will likely go to Buffalo or Cleveland furnaces, which have a lower rate of freight to Montreal than the Valley furnaces. Small lots of Bessemer pig iron are being sold by dealers at \$14.75 and \$14.85 at Valley furnace. The furnaces comprising the Bessemer Pig Iron Association are still holding Bessemer at \$15, but report no sales being made. We note a sale of 100 tons of Bessemer at \$14.75 and 200 tons at \$14.85, both by dealers. We quote as follows: Bessemer pig iron, \$15 nominally; malleable Bessemer, \$13.75; basic, \$13.25; No. 2 foundry, \$13.50 for prompt and \$13.75 for forward delivery; gray forge, \$13.25, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—Regular prices on Bessemer and open-hearth steel in the Pittsburgh district are being maintained, but in Cleveland and at other consuming points open-hearth steel is being offered at \$1 per ton less than regular prices. We note a sale of 300 tons of open-hearth slabs to a pipe mill, to be rolled into skelp, at \$23, Pittsburgh. Regular prices are as follows: Bessemer and open-hearth billets, 4x4 in. and up to, but not including, 10x10 in., at \$23, base, and sheet and tin bars in 30-ft. lengths, \$24; 1½-in. billets, \$24; forging billets, \$28, base, usual extras for sizes and carbons—all prices, f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(By Mail.)

The Supreme Court decision on the Standard Oil Company case is the chief topic of discussion in local steel circles, but as there has hardly been time to digest the decision thoroughly, no definite opinions have been expressed as to what its effect will be; nevertheless, the fact that a decision has been handed down cannot but be helpful. General conditions in the steel trade remain very quiet, new buying being at a low ebb and

specifications against contracts not coming in as freely as desired. Perhaps the greatest falling off in new business and specifications is in the wire trade, one leading interest reporting that its specifications so far this month are 60 per cent. less than in the first half of April. The pig iron market is weak, Bessemer iron having sold below \$15 in small lots and basic as low as \$13.25 at Valley furnace. Jobbers and consumers of finished material are buying only in small lots to cover actual needs, but in many cases specific requests are made for prompt shipment, showing that stocks all over the country are light. Two embargoes have been lifted on scrap and a little more is moving. Coke is dull, with the lowest prices ruling for some months.

Ferromanganese.—No sales are reported and new inquiries are very light. Most consumers are covered for the remainder of this year. We quote 80 per cent. foreign at \$36.50 to \$36.75, Baltimore, to which a freight rate of \$1.95 should be added for delivery in the Pittsburgh district.

Ferrosilicon.—Some small lots of 50 per cent., ranging from 25 to 100 tons, have been sold the past week at \$52 to \$52.50 delivered. We quote 50 per cent. at \$52.50 to \$53, Pittsburgh, for delivery through the third quarter; 10 per cent. blast furnace silicon, \$22; 11 per cent., \$24, and 12 per cent., \$25, f.o.b. cars, Ashland and Jisco furnaces.

Muck Bar.—The market is dull and neglected and we quote best grades of all pig iron muck bar at \$28.50 to \$29, Pittsburgh.

Skelp.—This trade is very quiet, the new demand being light on account of the dull condition of the pipe market. We quote: Grooved steel skelp, 1.30c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Wire Rods.—Nearly all consumers of wire rods now roll their own supply and very few rods are sold in the open market. We quote: Bessemer, open hearth and chain rods, nominally at \$29, Pittsburgh.

Steel Rails.—Among orders for standard sections received by the Carnegie Steel Company in the past week was one from a Western railroad for 8500 tons and an export order for 5000 tons. The company also received new orders and specifications against contracts in the past week for nearly 4000 tons of light rails and is having a fairly large demand for steel ties and splice bars. Prices on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b., at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per pound.

Structural Material.—A good deal of local work is in sight, including the Hotel Oliver to be built on Smithfield street, another large hotel on Penn avenue, the new steel bridge to be erected by the city at the Point crossing the Allegheny River, and the Pittsburgh Crucible Steel Company's works at Midland. It is estimated that these four jobs will take from 15,000 to 20,000 tons. The McClintic-Marshall Construction Company has taken 900 tons for the Detroit Free Press Building at Detroit, of which 700 tons will be Bethlehem sections. We quote beams and channels up to 15 in. at 1.40c., Pittsburgh.

Plates.—Few car orders have been placed the past week and new inquiries are light. Bids will go in May 22 for the aqueduct for the city of Los Angeles, Cal., about 4500 tons. The Philadelphia company is still in the market for a gas holder requiring about 6000 tons and this contract may be given out soon. Actual orders for plates booked so far this month are very much lighter than in the first half of April. Some mills continue to shade 1.40c. on narrow plates, but the general market on the wide sizes of ¼ in. and heavier plates is 1.40c., Pittsburgh.

Sheets.—Present conditions in the sheet trade are about as they have been for some weeks, the new demand being quiet and for small lots, while specifications against contracts are not satisfactory to the mills. It is estimated that not more than 60 per cent., if that much, of capacity is active at present. Prices, in the main, are fairly well observed, but there is still some cutting being done in certain sections. The contract for about 250 tons of iron sheets for the roofs and sidings of the new buildings of the Gary Screw & Bolt Company, Gary, Ind., will likely be placed this week. Regular prices on black galvanized and roofing sheets are printed on a previous page.

Tin Plate.—The new demand for tin plate is very

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dull, but specifications from the can makers have been coming in very heavily for several weeks and shipments of bright plate by the mills this month will probably show an increase over April. Present operations in tin plate capacity are at the rate of about 75 per cent. Prices are said to be very well maintained and we quote 100-lb. cokes at \$3.70 per base box f.o.b. Pittsburgh.

Bars.—The volume of new orders in both iron and steel bars and the shipments by the mills so far this year have been much below normal, and the outlook is that this condition will continue for some time. In previous years the implement makers and other large consumers of bars had by this time either placed their contracts for the year beginning July 1 or else were negotiating with the mills, but so far this year little or nothing in this direction has been done. About a month ago there were some preliminary negotiations, but when the steel mills named 1.40c. as their price on steel bars for the year beginning July 1 the buyers dropped the subject and it has not been taken up actively since. The implement makers and other large users of steel bars are using the argument that, being such heavy consumers, they are entitled to a concession over the ordinary buyer, which the mills do not feel inclined to give. The new demand for both iron and steel bars is light, and specifications against contracts are slow. We continue to quote soft steel bars rolled from billets at 1.40c., and common iron bars at 1.30c. to 1.32½c., Pittsburgh.

Shafting.—Several makers state that specifications from the automobile builders are coming in a little more freely, but new business and shipments are much below normal. Consumers are buying only such quantities of shafting as they absolutely need. Regular discounts on cold rolled shafting are 57 per cent. off in carloads and 52 per cent. in less than carloads delivered in base territory, but in some cases these discounts are shaded.

Spelter.—The market has quieted down again, the new demand being dull, while prices are weak. We quote prime grades of Western at 5.20c. East St. Louis, equal to 5.32½c., Pittsburgh.

Hoops and Bands.—New buying is confined to small lots to cover actual needs, and specifications against contracts are far from being satisfactory. The four leading mills rolling hoops and bands are not operating to more than 50 per cent. of capacity. We quote steel hoops at 1.45c. and bands at 1.40c., extras on the latter as per the present steel bar card. These prices are reported as being sometimes slightly shaded on desirable orders.

Merchant Steel.—The new demand is quiet and jobbers and consumers are specifying only for such quantities of material as they absolutely need. Prices are being fairly well held, but not enough new business is being offered to test the market. We quote the higher grades of merchant steels, f.o.b. Pittsburgh, as follows: Iron finished tire, ½ x 1½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—Jobbers and consumers are taking in only such quantities of rivets as they must have, there being no desire to accumulate stocks. We quote structural rivets at 1.75c. to 1.80c. and boiler rivets 1.80c. to 1.85c., Pittsburgh.

Wire Products.—The new demand and specifications against contracts continue to fall off steadily. Jobbers are specifying only for such quantities of nails and wire as they must have to meet the demand of retailers and to carry fairly complete stocks. There are signs of slight weakening in prices, but so far this is confined to a few points where competition is usually severe. We quote galvanized barb wire at \$2.10; painted, \$1.80; annealed fence wire, \$1.60; galvanized, \$1.90; wire nails, \$1.80, and cut nails, \$1.60, f.o.b. Pittsburgh, full freight to destination added.

Spikes.—A Southern road is reported in the market for 5000 kegs of spikes for delivery commencing July, and several of the Western roads have fair-sized inquiries out. The base price of railroad spikes in standard sizes is \$1.50, Pittsburgh, with the usual extras for odd sizes.

Merchant Pipe.—The only two active inquiries in the market for line pipe are those of the Southern California Gas Company, of Los Angeles, for 90 to 100 miles of 10 to 12 in. pipe and the Guaranty Pipe Line Company, of San Francisco, for about 80 miles of 4 to 8-in., but they may not be placed for some months, if

at all. The new demand for merchant pipe is only for small lots to cover actual needs. Jobbers are taking in merely such quantities of pipe as are absolutely needed to meet current orders. Regular discounts on iron and steel pipe, printed on a previous page, are reported as being fairly well maintained.

Boiler Tubes.—Negotiations are on with a number of leading consumers of boiler tubes for their requirements for the last half of the year, their present contracts expiring July 1. Some of these will run into the third quarter, as the tonnage involved in these contracts has not been taken out. The new demand for merchant tubes is very dull, being only for small lots to cover actual needs.

Coke.—No large inquiries for furnace coke are in the market from nearby furnaces, but several of the Eastern furnaces are asking prices for last half delivery. Several large consumers of foundry coke whose contracts expire July 1 are now negotiating for their supply for the last half of the year. We quote standard makes of furnace coke for May and June shipment at \$1.50 to \$1.60, and for delivery over the last half of the year at \$1.75 to \$1.85 per net ton, at oven. We quote standard makes of 72-hour foundry coke at \$1.75 to \$2 for spot shipment and from \$2.10 to \$2.40 to consumers, per net ton at oven, for the last half of the year. There has been a heavy reduction in the output of coke, the Upper and Lower Connellsville regions last week turning out only 280,367 tons, a decrease over the previous week of more than 20,000 tons. Further blowing out of ovens will likely take place owing to the very dull demand.

Iron and Steel Scrap.—The embargoes on scrap at Monessen, Pa., and Follansbee, W. Va., have been lifted and as a result a slightly larger tonnage of scrap on old contracts is now being shipped into these two consuming points than for some time. There is practically no new demand for scrap. Leading consumers have a very large tonnage due them on old contracts against which they have not been specifying very freely. Several leading brokers are not trying to effect new sales of scrap, taking the position that with so much undelivered tonnage on their books it is foolish to take on more new business. Not enough is being done to test prices, which are about the same as those ruling for several weeks. Dealers quote as follows, per gross ton, f.o.b. Pittsburgh, or elsewhere as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon Monessen and Pittsburgh delivery.....	\$12.50 to 13.75
No. 1 foundry cast.....	13.50 to 13.75
No. 2 foundry cast.....	12.50 to 12.75
Bundled sheet scrap, at point of shipment.....	9.00 to 9.25
Revolving rails, Newark and Cambridge, Ohio, and Cumberland, Md.....	13.50 to 13.75
No. 1 railroad malleable stock.....	12.00 to 12.25
Grate bars.....	10.50 to 10.75
Low phosphorus melting stock.....	16.50 to 16.75
Iron car axles.....	24.25 to 24.50
Steel car axles.....	18.50 to 18.75
Locomotive axles.....	23.00 to 23.25
No. 1 busheling scrap.....	12.00 to 12.25
No. 2 busheling scrap.....	8.50 to 8.75
Old car wheels.....	13.50 to 13.75
Sheet bar crop ends.....	15.50 to 15.75
* Cast iron borings.....	8.60 to 8.75
* Machine shop turnings.....	9.00 to 9.15
Old iron rails.....	15.00 to 15.25
No. 1 wrought scrap.....	14.25 to 14.50
Heavy steel axle turnings.....	10.25 to 10.50
Stove plate.....	10.50 to 10.75

* These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

Chicago

FISHER BUILDING, CHICAGO, May 16, 1911.

Decided activity in structural material is the feature of this week's market in the Chicago district. An improvement in railroad purchases is also noted, although the business of this nature is still small considering the needs known to exist. An additional blast furnace has gone out at Mayville, Wis., and it is quite probable that others in this territory will follow, the present consumption of pig iron being so far below expectations.

Pig Iron.—The activities of the week have scarcely made a ripple on the calmness that seems to have settled over the pig iron market. Foundry business is as dull as it has been for years, and anticipated pig iron wants covered earlier in the year for the first half are in numerous cases proving sufficient for the third or even fourth quarter. Several orders for spot delivery have been closed this week, but these are generally for single carload lots and in no instance have been for large tonnages. A Chicago manufacturer of mining machinery is in the market for 250 tons of Southern

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No. 2, and an inquiry for 1000 tons of Lake Superior charcoal is also reported. A slight reduction has been made in the price of the latter iron, and even that reduction is reported to be shaded. Prospective purchasers are not numerous and practically every buyer seems insistent upon lower prices. Very few consumers are offering more than \$10.50, Birmingham, for Southern No. 2, although so far as can be ascertained no such concessions have been made in this territory by Southern furnaces. The following quotations are for Chicago delivery, with the exception of Northern irons, which are now quoted f.o.b. furnace:

Lake Superior charcoal.....	\$17.00
Northern coke foundry, No. 1.....	15.50
Northern coke foundry, No. 2.....	15.00
Northern coke foundry, No. 3.....	14.75
Northern Scotch, No. 1.....	16.00
Southern coke, No. 1 foundry and No. 1 soft.....	15.85
Southern coke, No. 2 foundry and No. 2 soft.....	15.35
Southern coke, No. 3.....	15.10
Southern coke, No. 4.....	14.85
Southern gray forge.....	14.60
Southern mottled.....	14.60
Malleable Bessemer.....	15.00
Standard Bessemer.....	17.40
Basic.....	15.85
Jackson Co. and Kentucky silvery, 6%.....	17.90
Jackson Co. and Kentucky silvery, 8%.....	18.90
Jackson Co. and Kentucky silvery, 10%.....	19.90

Billets.—Several small quantities of forging billets have been sold. We continue to quote \$30.60, base, Chicago, on open hearth forging billets and \$25.60, base, on rerolling billets.

Sheets.—There has been little change in the demand for sheets. Mills continue to run at about two-thirds capacity, and the volume of business in sight is very moderate. Western mills are firmly maintaining prices, but constant rumors of price concessions reach here from the East. Producers here believe that some of the smaller mills, whose product is not as well known, are cutting prices, but this is not influencing their evident intention of maintaining the prices now in effect. While business so far this year has been less than that of the corresponding period last year, it is felt that under existing circumstances there is no great cause for complaint. Chicago prices are as follows: Carload lots, from mill: No. 28 black sheets, 2.38c.; No. 28 galvanized, 3.38c.; No. 10 blue annealed, 1.83c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Wire Products.—The demand for wire products has somewhat eased off, as is naturally expected at this time of year, and mills are now making prompt shipments of all items. Specifications continue to be good and the volume of new business coming in is very satisfactory considering that orders are of the sort-up nature. Prices are being well maintained. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire No. 9 and coarser, base, 1.78c.; wire nails, 1.98c.; painted barb wire, 1.98c.; galvanized, 2.28c.; polished staples, 1.98c.; galvanized, 2.28c., all Chicago.

Rails and Track Supplies.—Business in rails and track supplies has shown no improvement. The leading interest has booked orders for about 6000 tons of standard sections. Liberal orders for track supplies continue to come in and general specifications are very good. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.15c. to 2.25c., base, all in carload lots, Chicago. Standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20c.; 30 to 35 lb., 1.19c. to 1.24c.; 16, 20 and 25 lb., 1.20c. to 1.25c.; 12 lb., 1.25c. to 1.30c., Chicago.

Structural Material.—This is easily the most active item in the local market. The lettings of the week have emanated from a variety of sources, the largest single order coming from the Chicago, Rock Island & Pacific Railway Company. Other railroad companies have been inquiring, and it is practically certain that more business of this nature will be closed in the near future. Among the principal lettings of the week are the following: Main street bridge at Pendleton, Ore., 135 tons, to American Bridge Company; 1911 requirements for Chicago, Rock Island & Pacific Railway Company, 2500 tons, to American Bridge Company; high school, Omaha, Neb., 735 tons, to Ottumwa Bridge Company; McKinney, Hodge & Manse Building, Chicago, 975 tons, reinforced concrete; North Side Manual Training shops, school district No. 1, Denver, Col., 135 tons, to Paxton & Vierling; railroad bridges over drainage canal, East St. Louis, Ill., 810 tons, to King Bridge Company; W. A. Wieboldt theater and office building, Chicago, 485 tons, to George E. Laubheimer Com-

pany; floor system for pit furnaces for Minnesota Steel Company, New Duluth, Minn., 180 tons, to American Bridge Company; substation for Minneapolis General Electric Company, Minneapolis, Minn., 210 tons, and Sixth street substation, 120 tons, to Minneapolis Steel & Machinery Company; J. K. Stewart building, Chicago, 295 tons, to Hansell-Elcock Foundry Company; Chicago, Burlington & Quincy freight house, Omaha division, 530 tons, to Paxton & Vierling. We quote plain material from mill at 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—Some little improvement is noted in this week's plate market. The Burlington Railroad has placed additional car orders with the American Car & Foundry Company. The May rollings of plate are so far somewhat behind those of April, but a slight improvement is anticipated for the latter part of the month. The principal producers are maintaining Chicago mill prices at 1.58c. to 1.63c. Store prices are 1.80c. to 1.90c., Chicago.

Cast Iron Pipe.—Although the lettings of the week are small, the market is healthy and inquiries are such that no complaints are heard. Some of the small Western municipal bonds have proved a drag on the market, though the number is comparatively small. Some of the principal gas producers have been in the market and have closed for about 2500 tons of gas pipe. A Portland, Ore., interest has purchased 1500 tons. The leading maker has closed with Lewiston, Mont., for 1200 tons of water pipe. It is interesting to note in connection with this purchase that the freight rate from the manufacturing plant to the Montana town is \$23.40 per ton, which is about equal to the cost of the pipe. Enough business is in sight to make producers optimistic. Prices are firm as follows, per net ton, Chicago: Water pipe, 4 in., \$25.50; 6 to 12 in., \$24.50; 16 in. and up, \$24, with \$1 extra for gas pipe.

Bars.—Very little change is noted in the conditions that govern the bar market. Business is moderate and the supply is in excess of the demand. Rumors of price concessions, both on steel and iron bars, are common. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.58c.; bar iron, 1.22½c. to 1.27½c.; hard steel bars rolled from old rails, 1.30c. to 1.35c. From store, soft steel bars, 1.80c. to 1.90c., Chicago.

Old Material.—Few sales of scrap are being made in this market. Prices are shifting constantly, with little actual trading upon which to base changes. The weather has been extremely well adapted to the accumulation of scrap, and large quantities are being received daily in this territory. The Union Pacific Railroad is out with a list totaling about 6000 tons. Last week's prices on old steel rails for rerolling should have been \$12.25 to \$12.75, a typographical error having been made in setting up the table. Prices below are for delivery to buyers' works, all freight and transfer charges paid, per gross ton:

Old iron rails.....	\$14.75 to \$15.25
Old steel rails, rerolling.....	12.50 to 13.00
Old steel rails, less than 3 ft.....	11.25 to 11.75
Relaying rails, standard sections, subject to inspection.....	22.00 to 23.00
Old car wheels.....	12.75 to 13.25
Heavy melting steel scrap.....	10.25 to 10.75
Frogs, switches and guards, cut apart.....	10.50 to 11.00
Shoveling steel.....	10.25 to 10.75
Steel axle turnings.....	8.50 to 9.00
The following quotations are per net ton:	
Iron angles and splice bars.....	\$12.50 to \$13.00
Iron arch bars and transoms.....	13.50 to 14.00
Steel angle bars.....	10.50 to 11.00
Iron car axles.....	18.50 to 18.75
Steel car axles.....	17.00 to 17.50
No. 1 railroad wrought.....	11.00 to 11.50
No. 2 railroad wrought.....	10.00 to 10.50
Steel knuckles and couplers.....	10.00 to 10.50
Locomotive tires, smooth.....	17.00 to 17.50
Machine shop turnings.....	6.25 to 6.75
Cast and mixed borings.....	5.25 to 5.75
No. 1 busheling.....	9.00 to 9.50
No. 2 busheling.....	6.75 to 7.25
No. 1 boilers, cut to sheets and rings.....	7.50 to 8.00
Boiler punchings.....	12.00 to 12.50
No. 1 cast scrap.....	10.75 to 11.25
Stove plate and light cast scrap.....	9.25 to 9.75
Railroad malleable.....	10.25 to 10.75
Agricultural malleable.....	9.25 to 9.75
Pipes and flues.....	8.00 to 8.50

Cincinnati

CINCINNATI, May 17, 1911.—(By Telegraph.)

Pig Iron.—Local interests are unanimously of the opinion that the Standard Oil decision will tend to stimulate business. As the suspense is now over a general buying movement is expected to follow gradually. Last week, however, was an extremely dull one

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with pig iron dealers, and concessions were made that would justify the prompt shipment price of Southern iron being reduced to \$10.50 to \$11.00, Birmingham basis; for delivery through the remainder of the year, \$11 at furnace is quoted. Northern iron is generally quoted at \$14, Ironton, for immediate shipment, but a few sales have been made around \$13.75. The shading in prices appears to be centered on No. 2 foundry, as some small sales of lower grade foundry iron have been made at the regular market quotation. Malleable is not in demand. Standard Southern car wheel has shown some activity, and about 900 tons was taken on a basis of \$22.50, Birmingham, which represents the market price. There is no call for Northern basic, and it can be bought for \$14, Ironton, with delivery through the third quarter. Among the few inquiries out is one for 300 tons of foundry iron from Illinois melters. Inquiries from southern Indiana call for small lots of foundry iron for shipment during the third quarter. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry.....	\$14.25 to \$14.75
Southern coke, No. 2 foundry.....	13.75 to 14.25
Southern coke, No. 3 foundry.....	13.25 to 13.75
Southern coke, No. 4 foundry.....	13.00 to 13.50
Southern coke, No. 1 soft.....	14.25 to 14.75
Southern coke, No. 2 soft.....	13.75 to 14.25
Southern gray forge.....	12.50 to 13.00
Ohio silvery, 8 per cent. silicon.....	17.70
Lake Superior coke, No. 1.....	15.70
Lake Superior coke, No. 2.....	15.20
Lake Superior coke, No. 3.....	14.70
Basic, Northern.....	15.20 to 15.45
Standard Southern car wheel.....	22.50 to 23.00
Lake Superior car wheel.....	19.50

(By Mail.)

Coke.—Foundry coke is lagging and it is reported that contracts extending through the year can be made around \$2 at oven, including a few standard brands in the Connellsville, Wise County and Pocahontas field. For prompt shipment this figure can be shaded some. However, \$2.25 to \$2.30 is generally adhered to by a number of producers for future shipment orders. Furnace coke has practically no new demand, and shipments on contracts are moving only moderately well. Connellsville 48-hour coke is still obtainable around \$1.40 per net ton at oven, for prompt delivery, but Pocahontas and Wise County interests are holding out for a premium of 20c. to 25c. per ton. Contract figures on furnace coke in all three fields indicate a wide range, and the average price quoted is between \$1.70 to \$1.90 at oven.

Finished Material.—Railroad purchases of track material are very light, but there is a little improvement in plates; steel bars also appear to be holding up fairly well. Mill agencies quote a base price of 1.40c. Pittsburgh, but there has been some reported shading on the part of independents. The inquiry for hoops and bands is better, but actual business booked is about the same as for the past few weeks. Warehouse quotations on steel bars and structural material are from 1.90c. to 2c.

Old Material.—Dealers claim that they can buy all the scrap iron they want at figures below the recognized market quotations, but as the mills are taking very little scrap, there is an absence of incentive to take on any larger yard stocks. On the other hand, holders of scrap material, especially the railroads, are not inclined to unload at this time. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton.....	\$11.50 to \$12.00
Cast borings, net ton.....	4.50 to 5.00
Steel turnings, net ton.....	5.75 to 6.25
No. 1 cast scrap, net ton.....	9.75 to 10.00
Burnt scrap, net ton.....	7.00 to 7.50
Old iron axles, net ton.....	16.50 to 17.00
Bundled sheet scrap, gross ton.....	7.50 to 8.50
Old iron rails, gross ton.....	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton.....	21.00 to 22.00
Old car wheels, gross ton.....	11.00 to 12.00
Heavy melting steel scrap, gross ton.....	10.00 to 10.50

Philadelphia

PHILADELPHIA, PA., May 16, 1911.

Consumers appear to show even less interest in the market than has been the case for several weeks, and in some lines business has been almost suspended. The decision of the Supreme Court in the Standard Oil case, handed down Monday, has been so long delayed that the outcome has been largely discounted, and while it removes one of the unfavorable elements of business, other conditions, as yet unsettled, still restrict the normal movement. Pig iron transactions have been on a very small scale, and in steel making grades prices have shown weakness. There is practically no change

in the finished material situation. Buying in most lines drags, and prospects for new business of any size are not very bright. Sellers in this district maintain recent quotations, except for iron bars, which show a decline.

Iron Ore.—With the demand for pig iron dragging, ore buyers hesitate to enter into negotiations for further supplies. Little business is pending and no important sales have been made. Importations in the week ending May 15 include 11,400 tons of Cuban and 11,425 tons of Spanish ore.

Pig Iron.—The movement in foundry grades has been extremely light. A considerable quantity of basic iron for prompt and early delivery has been sold to Eastern consumers at \$14.50, delivered, a concession from recent prices, and negotiations are pending for a further large amount, which buyers would take for more extended delivery, but sellers have not yet decided to sell for forward shipment at the same price they have been willing to accept for early delivery. Inquiry for low phosphorus iron, particularly for more extended delivery, is said to have been quietly made, while some small lot sales of standard grades have been made for early shipment at \$21, delivered here. In the foundry grades business has been confined to small lots, consumers apparently paring down purchases to the smallest quantities. Transactions in few instances exceed 100-ton lots. Inquiries for forward delivery are light, although in several cases buyers have been testing the market, but sellers are not disposed to sell ahead at the present range. Negotiations for lots of several hundred tons of regular brands are pending, but little of this business is coming into the open market. Prices of standard brands of No. 2 X foundry are pretty well maintained at \$15.50 to \$15.75, delivered, either for prompt shipment, or extending into the third quarter. Very little business in low grade iron is reported, but negotiations are pending for several small lots. The movement in Virginia foundry grades has been unimportant and prices are unchanged. Forge iron continues uncalled for and prices are quoted nominally. The following range of prices is named for standard brands, delivered in buyers' yards, eastern Pennsylvania and vicinity, for shipment extending over the remainder of the second quarter and in instances also over the third quarter:

Eastern Pennsylvania No. 2 X foundry.....	\$15.50 to \$15.75
Eastern Pennsylvania No. 2 plain.....	15.00 to 15.25
Virginia No. 2 X foundry.....	15.80 to 16.00
Virginia No. 2 plain.....	15.80 to 16.00
Gray forge.....	14.75 to 15.00
Basic.....	14.50 to 15.00
Standard low phosphorus.....	21.00

Ferromanganese.—No fresh inquiry has developed in this district and the market is practically at a standstill. Prices are quoted by sellers at \$36.50 to \$37, Baltimore, depending on quantity, delivery and the customer.

Billets.—The demand continues light and conditions confronting producers are unchanged. In some instances efforts have been made to get price concessions, but inquiries are confined to small lots, and makers continue to hold recent quotations. Prices are firm at \$25.40 for open hearth rolling billets and \$30.40 for ordinary forging billets, delivered in buyers' yards in this vicinity.

Plates.—While there has been a fairly good run of orders, mostly of a miscellaneous character, the aggregate volume of business shows no gain. A good day's business is frequently followed by a poor one, and mill order books are hardly in as good shape as they were some weeks ago. A trifle better prospect is to be noted in boat and structural plates. Prices are being fully maintained by Eastern sellers at 1.55c., delivered here, which represents the minimum for ordinary plates.

Structural Material.—Few propositions of any importance have developed in this immediate vicinity. Bids for the addition to the building of the Maryland Casualty Company, Baltimore, will be opened early next week, requirements for which will be about 1100 tons. The American Bridge Company is reported low bidder on the Philadelphia & Reading elevation work on its Port Richmond Branch, some 4300 tons being involved. Several small building contracts and some small bridge work for the city will shortly be placed, but there is an absence of any new business of large size in this district. There is a fair demand for plain shapes, but mills show practically no gain in their productive rate. Prices of plain shapes are firm at 1.55c. minimum, delivered. While cutting for fabricated work is not so pronounced, low prices for this class of work continue to be made.

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Sheets.—Several mills in this district have again been operating at full capacity, but the demand has been so irregular that producers cannot figure far ahead as to any probable basis of operation. Buyers come into the market for immediate and near future requirements, but show no interest in forward buying. Current business is entirely of a day-to-day character, and no change in this condition is expected in the near future. The following range of prices is quoted for prompt shipments, Eastern makers' mill: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—Mills for the most part are operating on an unsatisfactory basis, as orders coming out are small. Consumers of refined iron bars hold business back, awaiting price developments, and usually find makers who are anxious for orders willing to make concessions. Refined iron bars for early delivery, on which specifications are desirable, are to be had at 1.22½c., Eastern mill, equal to 1.30c., delivered here, although some producers will not accept business at that figure. A full range of the market for refined iron bars is about 1.30c. to 1.35c., delivered in this district. Steel bars are reported as somewhat quieter, specifications being less plentiful.

Coke.—A few small contracts for foundry coke, for delivery extending over the last half, at \$2.25 to \$2.40 per net ton at oven, have been reported; but the general demand is not active. Prompt foundry coke continues to be taken by some producers at close to \$2 at oven. Less interest is being shown in furnace coke; consumers being to some extent uncertain as to their requirements continue to place orders merely for prompt and near future needs. For delivery in this vicinity the following range of prices, per net ton, is named:

Connellsville furnace coke.....	\$3.70 to \$4.05
Foundry coke	4.15 to 4.55
Mountain furnace coke.....	3.30 to 3.65
Foundry coke	3.75 to 4.15

Old Material.—The market shows little variation; consumers are not in need of material and confine purchases to bargain lots. Steel mills do not offer over \$13 for No. 1 heavy melting steel, but if the grade was particularly good and a round lot offered, \$13.25 would be paid. Dealers pay the latter figure for No. 1 material to apply on higher price contracts, but there are few sellers who are willing to dispose of any quantity at the present price level. In some instances rejections have been heavy, buyers making close inspection before accepting shipments. Rolling mill grades are particularly quiet, and any important sales are usually at price concessions. Machinery cast has been offered freely at \$13 to \$13.50, without getting buyers. There has been a little movement in wrought iron pipe at prices lower than quoted last week. In many grades an absence of sales is noted, while in others hardly enough business has been done to establish a market. The following range of prices about represents sellers' ideas of the market for deliveries in consumers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 35c. to \$1.35 per gross ton:

No. 1 heavy melting steel scrap.....	\$13.00 to \$13.25
Old steel rails, rerolling.....	14.00 to 14.25*
Low phosphorus heavy melting steel scrap.....	16.75 to 17.25
Old steel axles.....	19.25 to 19.75*
Old iron axles.....	24.00 to 24.50*
Old iron rails.....	16.75 to 17.25
Old car wheels.....	13.00 to 13.50
No. 1 railroad wrought.....	15.00 to 15.50
Wrought iron pipe.....	12.50 to 12.75
No. 1 forge fire.....	10.50 to 11.00
No. 2 light iron.....	7.00 to 7.50*
Wrought turnings.....	8.25 to 8.75
Cast borings.....	7.75 to 8.25
Machinery cast.....	13.00 to 13.50
Railroad malleable.....	11.50 to 12.00
Grate bars, railroad.....	10.50 to 11.00
Stove plate.....	10.00 to 10.50

*Nominal.

Buffalo

BUFFALO, N. Y., May 16, 1911.

Pig Iron.—The market continues quiet. Only a small proportion of the inquiry which developed late last week has materialized into orders. The remainder, together with a good share of the inquiry coming in during the current week, is still pending. Included in the current inquiry is 2500 tons, basic, from a Canadian source, said to be for a Welland concern. Other Canadian inquiries are for "hematite," for a considerable tonnage of low silicon and for low phosphorus. Three inquiries for 500 tons each for foundry grades are

noted, one from New England and the others from local points. An air brake company has placed an order for about 1000 tons of foundry grades and orders for several carloads of charcoal iron are reported. Most inquiry is for comparatively prompt delivery, starting in June and finishing by the end of the third quarter. Prices are unchanged and fully as firm as a week ago, furnacemen believing that consumers are beginning to realize that furnaces cannot stay in blast if any lower prices are made and that curtailment in production will ensue rather than a reduction in price. We quote as follows, f.o.b. Buffalo, for second and third-quarter delivery:

No. 1 X foundry.....	\$14.25 to \$14.75
No. 2 X foundry.....	14.00 to 14.50
No. 2 plain.....	13.75 to 14.00
No. 2 foundry.....	13.50 to 13.75
Gray forge	13.25 to 13.50
Malleable	14.00 to 14.50
Basic	14.25 to 14.75
Charcoal	16.75 to 17.50

Coke is selling fairly well, although principally in small contracts.

Finished Iron and Steel.—Almost all lines of finished material show quiet conditions and a contraction in the amount of new business placed, although in bar material and plates preliminary negotiations are under way on one or two large contracts. The leading interest reports the sale of 2000 tons of bar products to a New York State interest. Canadian export trade is of fair volume, although not as good as it was in April. In fabricated structural material a good amount of new business is coming out. Figures are soon to be received for another large addition to the plant of the Johnston Harvester Company, Batavia, N. Y., requiring 1000 to 1100 tons of steel. The Syracuse Bridge Company was low bidder for the fabrication and erection of the Rosenbloom department store and loft buildings, Syracuse, 1000 tons, and the Lackawanna Bridge Company has received the contract for the steel for the Atlas Steel Casting Company's plant at Buffalo, 150 tons.

Old Material.—The market continues flat and without signs of improvement, conditions being practically the same as reported a week ago. No interest is being manifested by consumers. Only exigency orders to cover immediate needs are going through, and these in insufficient volume to affect values or to be used as a basis for quoting. Price schedules remain unchanged and nominal. We quote as follows, per gross ton f.o.b. Buffalo:

Heavy melting steel.....	\$11.50 to \$12.00
Low phosphorus steel.....	14.00 to 14.50
No. 1 railroad wrought.....	13.25 to 13.50
No. 1 railroad and machinery cast scrap.....	12.75 to 13.25
Old steel axles.....	18.00 to 18.50
Old iron axles.....	22.00 to 22.50
Old car wheels.....	12.50 to 13.00
Railroad malleable	11.00 to 11.50
Boiler plate	9.50 to 10.00
Locomotive grate bars.....	10.00 to 10.25
Pipe	9.00 to 9.25
Wrought iron and soft steel turnings.....	6.25 to 6.75
Clean cast forgings.....	6.00 to 6.25

Cleveland

CLEVELAND, OHIO, May 16, 1911.

Iron Ore.—The market is very quiet. Sales during the week were limited to a few small lots. Some of the furnace interests that will need ore later announce that they will probably not come into the market before August. An Eastern steel company has been feeling the market with an inquiry for about 100,000 tons of low grade non-Bessemer ore a year for five or ten years, but the business has not been placed. There was 6,850,285 tons of ore on Lake Erie docks May 1, as compared with 5,444,080 tons May 1, 1910. Shipments from Lake Erie docks to furnaces from December 1 to May 1 were 2,576,596 tons. The entire movement of Lake Superior ore to furnaces from Lake Erie ports during the year ending May 1 was 32,636,692 tons. This was the largest movement in any one year with the exception of the year ended May 1, 1910, when the movement was nearly 1,000,000 tons greater. The amount on docks May 1 exceeds the previous record of 1908 by 1,572,034 tons. Ore boats owned by shippers are being gradually placed in commission, but many of the independent boats will not be started before June. We quote prices as follows: Old range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; Old range non-Bessemer, \$3.70; Mesaba non-Bessemer, \$3.50.

Pig Iron.—The market shows very little activity.

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Some sales of small lots of foundry iron for spot shipment and the third quarter are reported, this business coming entirely from the smaller foundries. Shipments on considerable foundry iron has been held up recently and some of the consumers will have enough iron left over from their first half contracts to last them through July or August. In spite of lower quotations in the valley on basic, ranging from \$13.25 to \$13.50, a local furnace is still quoting basic at \$14. There is a local inquiry for 300 tons of basic for prompt shipment. No. 2 foundry is quoted at \$13.75, Valley furnace, for the second quarter, and \$14 for the last half. Some of the producers are holding firmly to \$11, Birmingham, for No. 2 Southern foundry for the last half, but some resale Southern iron for prompt shipment was sold during the week at \$10.75. For prompt shipment and the second quarter we quote, delivered Cleveland, as follows:

Bessemer	\$15.90
Basic	\$14.00 to 14.25
Northern foundry, No. 1.....	14.50
Northern foundry, No. 2.....	14.25
Gray forge	13.50
Southern foundry, No. 2.....	\$15.10 to 15.35
Jackson Co. silvery, 8 per cent. silicon.....	18.00

Coke.—The market is quiet and prices on furnace grades for prompt shipment are weak. Some contracts for Wise County foundry coke have just been made for shipment in this territory at \$2.25 per net ton, at oven, for delivery during the year from July 1. We quote standard Connellsville furnace coke for spot shipment at \$1.45 to \$1.60 per net ton at oven, and \$1.75 to \$1.80 for the last half. Connellsville 72-hour foundry coke is held at \$1.95 to \$2 for prompt shipment and \$2.15 to \$2.40 for the last half.

Finished Iron and Steel.—Mill agencies are getting a good volume of orders for small tonnages, buyers ordering only for their immediate needs. The structural situations shows some improvement. Specifications are out for the Statler Hotel in Cleveland. It will require 3500 tons of steel. It is understood that the contract will be placed in Buffalo. Bids on the Central Y. M. C. A. building, Cleveland, 1500 tons, will close May 22. The Forest City Steel & Iron Company has taken the contract for 125 tons for a memorial building to be erected in Cleveland for the Woman's College. Considerable structural work will be closed shortly requiring from 100 to 200 tons. Prices on steel bars and structural material are firm at 1.40c., Pittsburgh. and very little shading is reported on plates. The Upson Steel Company, Cleveland, is now in the market for steel bar orders. This company expects to start up its bar mill some time next month. The demand for sheets continues only moderate. Some of the leading independent mills are maintaining prices, but a considerable concession is being made by a few of the smaller mills. The placing of a sheet contract for 2500 tons for delivery during the last half of the year is reported at a concession of \$2 a ton on black and \$3 a ton on galvanized. A western New York car company has an inquiry out for 1150 tons of iron bars and considerable other material, including bolts and rivets. This is the largest inquiry for iron bars that has come out for some time, and it is expected that it will call forth some low prices. Bar iron is generally quoted at 1.30c. at mill. The local bar iron mills are now running at about 75 per cent. of their capacity. Jobbers are getting a fair volume of local business, but warehouse orders for outside shipment are light.

Old Material.—The inactivity in the market continues. Quotations are for the most part unchanged, but the market is weak and prices on most grades are largely nominal. Mills are buying only in small lots for their early needs and the offerings are light. Dealers are refusing to sell yard stocks at present prices. One local consumer is offering \$11 for heavy melting steel, but is getting very little at that price. The Michigan Central Railroad list will close May 18 on about its usual quantity. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling.....	\$13.00 to \$13.50
Old iron rails.....	15.00 to 15.50
Steel car axles.....	17.50 to 18.00
Heavy melting steel.....	11.00 to 11.50
Old car wheels.....	11.50 to 12.00
Relaying rails, 50 lb. and over.....	22.50 to 23.50
Agricultural malleable.....	11.00 to 11.50
Railroad malleable.....	11.50 to 12.00
Light bundled sheet scrap.....	7.50 to 8.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles.....	\$21.00 to \$21.50
Cast borings	6.00 to 6.25

Iron and steel turnings and drillings.....	6.25 to 6.50
Steel axle turnings.....	8.00 to 8.50
No. 1 busheling.....	9.50 to 10.00
No. 1 railroad wrought.....	11.50 to 12.00
No. 1 cast.....	11.25 to 11.50
Stove plate	10.25 to 10.50
Bundled tin scrap.....	11.00 to 11.50

San Francisco

SAN FRANCISCO, May 9, 1911.

Aside from some indication of activity in structural material, little improvement is noted in the Pacific Coast market for steel products. Excessive offerings and continued apathy of purchasers have caused a weakening of prices in some branches. Speculative business is entirely lacking, and so far the consuming demand has been below normal, purchases even by the larger interests being of a hand-to-mouth order.

Bars.—There is a fair demand for reinforcing material, with prospects of improvement within the next few months, owing to plans which are coming out for concrete buildings and a large amount of development work to be carried out in the interior of the State. According to figures recently compiled, shipments of cement from California to Oregon since the first of the year have been heavier than ever before. The bar market in general, however, remains quiet, and orders placed with domestic mills, either by merchants or consumers, are very small. Imported bars are moving to some extent, but mostly in a small jobbing way, and with large supplies in store there is increasing pressure to sell. The market is also weakened by the competition of local iron bars, and prices are unsettled, occasional sales being reported of iron bars as low as 1.80c. and steel at 1.90c., though the prevailing quotations are still 2c. for steel and 1.90c. for iron.

Structural Material.—The April building record in San Francisco was hardly as favorable as for March, and a slight decrease occurred in a number of other coast cities, though dealers in most building materials report increasing activity. An improvement is assured for this month, if awards are made on the buildings which are now being figured. Local fabricators have a fair amount of unfinished work on hand, including a few jobs which have come out since the first of the month, though little important work has been booked. Dyer Bros. have on hand a Spanish church at Broadway and Mason streets, and have just taken the Marye Building, at Seventh and Mission streets, requiring about 70 tons. The Schrader Iron Works has taken a contract for about 100 tons for the Ohlandt & Buck Building, and the Ralston Iron Works has a small job for the Lexington Realty Company. A number of small highway bridges are coming out, both in California and the north coast States. The plans for the Oakland city hall are said to call for about 3,500 tons of steel. Bids on the L. C. Smith Building at Seattle, Wash., will be opened May 10 at Syracuse, N. Y. This plan is said to call for about 3,600 tons. New figures are being taken on the Masonic Temple in this city, and it is believed that the contract will be let. Plans for the new St. Luke's Hospital, San Francisco, will be completed in two or three months. It will be class A throughout, the estimated cost being about \$400,000. The Pacific Gas & Electric Company is planning to build three steel towers at San Jose, Cal. Plans will soon be out for the D. O. Mills bank at Sacramento, Cal., and it is reported that William Land will erect a six-story class A building in the same city. The Harri-man railroad interests are planning to build steel frame passenger stations at Aberdeen and Hoquiam, Wash.

Rails.—There is a fair inquiry for light rails for the mines, and an increasing movement is expected, though at the moment there is less activity than a month ago. The movement of standard sections is keeping up fairly well, though individual orders are small, and the immediate requirements of the logging interests seem to be pretty well satisfied. Reports are current of several deals which may bring out a good volume of business before the end of the year. A contract has been closed for construction work on the portion of the Oakland & Antioch Railroad between Walnut Creek and Oakland, a distance of 17½ miles. The East Shore & Suburban line, between Oakland and Richmond, Cal., has been acquired by the United Properties Company, and there is some talk of its being extended to compete with the Oakland & Antioch. It is also rumored that Speyer & Co., of New York, have secured control of the Ocean Shore Railway, and that the road will be completed.

Sheets.—The distributive trade in black and galvan-

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ized sheets shows more life than for some time past, though there is no really active demand. Some orders are being placed by merchants, however, and an increasing movement is expected.

Plates.—The small jobbing trade is very quiet, and no new business of any consequence has come out in the line of tank or penstock construction, though inquiries are expected shortly for a considerable tonnage.

Merchant Pipe.—The oil pipe business is practically dormant, and no revival is expected for some time to come. There is at present more oil on the surface than can be readily marketed, and both storage and transportation facilities are severely taxed, while financial conditions appear unfavorable for any large development in the way of pipe lines. Work has been stopped on most of the independent wells, and while some of the larger interests are operating on the usual scale they are buying little pipe. Local merchants report continued dullness in the small trade, though some of the mill representatives note a slight increase in business, and a few inquiries in connection with waterworks are coming out. It is believed that steel pipe will be used in several new municipal projects in northern California.

Cast Iron Pipe.—Recent bookings include nothing of an unusual nature, though the tonnage is satisfactory for this territory, and several large inquiries are in the market. San Diego, Cal., is out with an inquiry for 8,000 tons, on which considerable competition is expected. The People's Water Company, Oakland, Cal., is coming into the market and expects to replace a large part of its old system of steel mains. The Chico Water Supply Company, Chico, Cal., has purchased 100 tons. The Pacific Gas & Electric Company and the Southern California Gas Company continue to place small orders at frequent intervals. By a compromise of the local gas rate controversy, the San Francisco Gas & Electric Company has received \$500,000 on condition that it be used for extensions. The city of Spokane, Wash., has ordered 2,500 ft. of 4 and 6-in. pipe. A government contract for the local Presidio water system will be let May 17.

Pig Iron.—The foundry trade is buying in a very small way. Values are unsettled and buyers can pick up small lots of good English or Continental foundry iron, brought as ballast, at about \$20 on the wharf. Domestic pig iron is not moving here to any extent, but is nominally valued at \$21.

Old Material.—The local demand has been extremely small for some time, and with increased offerings prices have declined sharply. A heavy tonnage of cast scrap has been sold by the railroads to dealers, and rerolling rails are offered freely with practically no market at the moment. Prices are quoted as follows: Cast iron scrap, per gross ton, \$16; steel melting scrap, per gross ton, \$10.50 to \$11; railroad wrought scrap, per net ton, \$12.50 to \$15; country wrought, \$11 to \$12; rerolling rails, per net ton, \$11.

The Rudge-Merle Company, San Francisco, is installing a new furnace in connection with its rolling mill, and on completion of the furnace will overhaul the mill, which has not been in operation for some time. The mill is intended to reroll old rails, the output of small shapes being used for the manufacture of bedsteads and ornamental work.

Birmingham

BIRMINGHAM, ALA., May 15, 1911.

Pig Iron.—Strong denial is still made that the \$11 schedule on pig iron has been broken, yet it is pretty generally felt that a firm offer of \$10.50 for No. 2 foundry would be accepted, especially if the tonnage were attractive and shipments to be made within the current quarter. It is believed, however, that no iron has been sold for consumption in the South at less than the \$11 figures. There are several large inquiries pending. One manufacturer of pipe has a feeler before the local trade for 2000 to 3000 tons. Actual transactions closed the past week were without doubt light. Foundry stocks on furnace yards in Alabama showed an increase the past month of approximately 17,500 tons, while stocks of basic iron showed a decrease of 14,000 tons, with practically no change in the stocks of pig iron in warrant yards. Some buyers claim to be looking for and confidently expecting a price of \$10, Birmingham, but such parties are evidently not familiar with conditions attending the present cost of producing pig iron on the wage scales prevailing in this district. Unless there should be a very material reduction in

the cost of mining ore and coal it is quite certain that such a price on iron would result in putting a number of furnaces out of blast. Quotations are nominally as follows, all per ton of 2240 lb., f. o. b. cars, furnace yards, in this district:

No. 1 foundry and No. 1 soft.....	\$11.50
No. 2 foundry and No. 2 soft.....	11.00
No. 3 foundry.....	10.50
No. 4 foundry.....	10.00
Gray forge.....	9.50
Standard basic, chill cast.....	11.00
"Off" basic.....	10.50
Charcoal car wheel iron.....	22.50

Cast-Iron Pipe.—Some fair contracts were closed the past week; in fact, sufficient business appears to have been booked to put the pipe makers in a decidedly pleasant frame of mind, and it is the expressed opinion that there is little expectation of any material reduction in the output of cast-iron pipe in this section for several months. Prices are firmly held at recent prevailing schedules, which are approximately as follows, per net ton, on board cars at foundries here: 4 to 6 in., \$22.50; 8 to 12 in., \$22; over 12 in., average \$21, with \$1 per ton extra for gas pipe.

Coal and Coke.—Coke is in better demand, especially the higher grades of foundry coke. Prices are very firm, both on Virginia and Alabama brands. Coal is exceedingly dull, with mines running at a materially reduced rate of production as compared with last year. As a result, prices of coal are as low as they have been at any time in several years.

Old Material.—Some slight improvement is noted in the movement of scrap, but principally at the expense of the price. It is taking concessions to move any quantities of consequence. At the same time, dealers are not letting any opportunity get away to close for any tonnages that are offering at unusually low figures. Chattanooga has taken some scrap, and the mills at Alabama City and Knoxville continue to purchase, though the buying is generally of the hand-to-mouth character. Prices remain nominally as follows, per gross ton, f. o. b. cars here:

Old iron axles (light).....	\$14.50 to \$15.00
Old steel axles (light).....	13.50 to 14.00
Old iron rails.....	13.00 to 13.50
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	10.50 to 11.00
No. 1 country wrought.....	8.00 to 8.50
No. 2 country wrought.....	7.50 to 8.00
No. 1 machinery.....	10.50 to 11.00
No. 1 steel.....	9.50 to 10.00
Tram car wheels.....	9.00 to 9.50
Standard car wheels.....	10.50 to 11.00
Light cast and stove plate.....	8.00 to 8.50

New York

NEW YORK, May 17, 1911.

Pig Iron.—The market has been duller than for several weeks. One sale of 2000 tons is reported, but few were beyond 200 tons. Rather freer competition has appeared in the Buffalo market. New York State and New England foundries are generally taking deliveries according to contract, but there is some holding up of shipments in New York and the New York City district. We quote on Northern iron at tide-water as follows: No. 1 foundry, \$15.50 to \$16; No. 2 X, \$15.25 to \$15.50; No. 2 plain, \$15 to \$15.25. For Southern No. 1 Foundry we quote \$15.50 to \$15.75; No. 2, \$15.25.

Steel Rails.—The principal export sale is one of 5000 tons to the Entrerios Railroad in Argentina. In New England scattered inquiries have come up for 2150 tons of rails and out of these one order for 1100 tons has been placed. The Pennsylvania Steel Company has the contract for 5000 tons of girder rails for the Chicago Railways. The Monongahela Railroad has bought 1000 tons from the Carnegie Steel Company; the New Orleans, Mobile & Chicago, 500 tons from the Tennessee Company, and Stone & Webster, 530 tons from the Colorado Fuel & Iron Company.

Finished Iron and Steel.—Marked dullness continues. Though there is probably a widening belief that fundamentally conditions are improved, no one seems to look for quick manifestation of the change. In fact, some mills are reported so eager for business that prices have been shaded. Plates have been cut by some Eastern concerns, it is claimed; bar iron is admittedly quite weak, and close figuring by fabricators is still charged. It is believed that about 65 per cent. of plate-rolling

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capacity is in operation. In this branch there is better outlook for activity in the weakening of the local machinists' strike. There is seemingly considerable variation in bar iron selling prices, and they are probably as low now as they have been at any time since the summer of 1900. Large work in structural lines is conspicuous for its small aggregate volume. Of new projects may be mentioned: 1200 tons for a power and pump house in Brooklyn of the American Sugar Refining Company; a building for the National Express Company, and 3300 tons of plates and shapes for concrete-steel work of the aqueduct being built for New York by its Board of Water Supply. The so-called connecting bridge, involving, it is reported, 36,000 tons, for making railroad connection between Long Island and the upper part of New York City, has reached the stage of asking for bids, but at this writing it is not known that the financial arrangements have all been effected. The structure of the New York Telephone Building on Walker street will be erected by the Levering & Garrigues Company, and a 700-ton contract for the Ordway Building, Newark, N. J., has gone to the Hay Foundry & Iron Works. An award on the 6000 tons of the Bamberger department store in Newark is expected at this writing. The Osborn Engineering Company, Cleveland, has the contract for the concrete-steel grandstand at the Polo Grounds, New York, and the American Bridge Company has an order for 4500 tons for track elevation for the Philadelphia & Reading Railroad. Quotations are: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.30c. to 1.40c., all New York. Plain material and plates from store, New York, 1.85c. to 1.95c.

Cast Iron Pipe.—Prospects for business have improved materially. While private buying is light, the inquiry has notably increased. Quite a number of public lettings are announced for the near future. The Metropolitan Water and Sewerage Board, Boston, Mass., will open bids May 22 for 2750 tons of water pipe. Lynn, Mass., will open bids on the same day for 1200 tons. The Department of Water Supply, Gas and Electricity of the City of New York will open bids on contracts for laying water pipe involving the quantities named as follows: May 19, for the borough of Richmond, 6500 tons, including specials; May 24, for the borough of Queens, 1580 tons, and on the same date for the borough of the Bronx, 8900 tons. Carload lots of 6 in. are quoted at \$21 to \$22 per net ton, tidewater.

Ferroalloys.—The ferromanganese market is very quiet and consumers are confining their inquiries to requests for quotations on lots of 50 tons and less. Dealers here are asking from \$36.50 to \$36.75, Baltimore. Very little ferrosilicon is being sold and the usual quotation is \$52.50 to \$53, Pittsburgh.

Old Material.—About the only business of any importance recently closed in this market has been in heavy melting steel scrap. While the demand was closely confined to small lots, the aggregate reached a fair tonnage. Very little rolling mill stock has either been sold or moved, as the rolling mills in the East are only running spasmodically. Cast scrap is almost neglected, with rather large offerings. Quotations are as follows, per gross ton, New York and vicinity:

Rerolling rails.....	\$12.00 to \$12.25
Old girder and T rails for melting.....	10.50 to 11.00
Heavy melting steel scrap.....	10.50 to 11.00
Relaying rails.....	20.00 to 21.00
Standard hammered iron car axles (nominal).....	22.00 to 22.50
Old steel car axles (nominal).....	17.25 to 17.75
No. 1 railroad wrought.....	13.00 to 13.50
Wrought iron track scrap.....	12.00 to 12.50
No. 1 yard wrought, long.....	11.50 to 12.00
No. 1 yard wrought, short.....	10.00 to 10.50
Light iron.....	4.50 to 5.00
Cast borings.....	5.50 to 6.00
Wrought turnings.....	6.00 to 6.50
Wrought pipe.....	10.50 to 11.00
Old car wheels.....	11.50 to 12.00
No. 1 heavy cast, broken up.....	11.50 to 12.00
Stove plate.....	9.00 to 9.50
Locomotive grate bars.....	9.00 to 9.50
Malleable cast.....	10.00 to 10.50

Metal Market

NEW YORK, May 17, 1911.

THE WEEK'S PRICES

Copper, New York.		Tin.		Lead.		Spelter.	
May.	Lake.	Electro-lytic.	New York.	New York.	St. Louis.	New York.	St. Louis.
11.....	12.25	12.10	42.40	4.40	4.20	5.50	5.25
12.....	12.25	12.00	42.50	4.40	4.20	5.50	5.25
13.....	12.20	11.90	4.40	4.20	5.50	5.20
15.....	12.20	11.90	42.35	4.40	4.20	5.50	5.20
16.....	12.25	11.95	42.80	4.40	4.20	5.50	5.20
17.....	12.25	12.00	43.00	4.40	4.20	5.50	5.20

Electrolytic copper was sold during the week as low as 11.90c. There have been heavy deliveries for export. Pig tin was up to 43c. this morning, which is 1½c. higher than a week ago. Spelter and lead are weak and dull.

Copper.—Copper is weaker and the market is much disorganized. This situation has been brought about by the fact that some of the leading selling interests have declined to make any price announcements and the suspicion is abroad that considerable cutting is being done. Electrolytic copper has been sold during the week as low as 11.90c. and some good sales were recorded at 11.95c. The deliveries into export during the month so far have been heavy, amounting in all to 13,529 tons. It is understood that some good sales of both electrolytic and lake were made for foreign account during the week and most of this copper was sold for delivery during the next six weeks. Lake seems to be stronger than electrolytic and as a rule 12.25c. is being quoted, although it is known that some sales were made at around 12.20c. The London market has been strong all the week and has gradually advanced from day to day. This morning the market there opened with spot copper selling at £54 3s. 9d. and futures at £54 15s.

Pig Tin.—Good sales of pig tin for early delivery were made on Monday and Tuesday, and there were inquiries for some fair-sized lots this morning. Although pig tin has been below the import parity all the week, the market has steadily strengthened from day to day and this morning sellers were demanding 43c. a lb., which is 1½c. higher than the price a week ago today. There seems to be plenty of spot tin available, and while the demand from the consumers have been fairly good during the last few days the business is not very well distributed. Yesterday afternoon some good sales were made at 42.80c., but dealers who were quoting that price yesterday are asking 43c. this morning, as there has been a corresponding advance in the London market which opened with spot tin selling at £190 8s. 10d. and futures at £190 15s. The arrivals of pig tin so far this month have not been heavy, amounting in all to 1659 tons. There are 1245 tons of tin afloat, much of which will arrive before the month is out.

Tin Plates.—Following an advance in the London price of pig tin, quotations on foreign tin plates have advanced 1¼d. Early in the week Swansea plates were offered as low as 13s. 6d., but this morning's price in London was 13s. 7¼d. The call for foreign tin plates is not very good as the present price is considered somewhat prohibitive. The domestic demand is light and there is considerable pressure to sell on the part of Western independent tin plate manufacturers who have invaded the Eastern market in search of business. Quotations are unchanged at \$3.94 for 100 coke plates.

Lead.—Lead continues weak and independent sellers are making the price both here and in St. Louis. The leading interest continues to ask 4.50c. in New York while outside sellers are demanding 4.40c. The St. Louis market is weak at 4.25c. and concessions are being made rather freely.

Spelter.—Spelter is selling fairly well, but buyers do not seem to want to commit themselves as to their future needs. They are taking stock only as they use it and the competition for the business in sight is so keen that prices vary. There are dealers in St. Louis who are willing to sell at 5.20c. and some offers of August spelter are being made as low as 5.15c. Most of the consumers here are buying for prompt shipment from the West as spot spelter continues high in this market, the usual quotation being 5.50c.

Antimony.—Antimony is dull and consumers seem interested only in the Hungarian and Chinese grades, which are being offered at around 8.12½c. Hallett's can be had at 9c. while Cookson's is very firm at 0.50c.

Old Metals.—Domestic business is very slow. Dealers' selling quotations are nominally unchanged as follows:

	Cents.
Copper, heavy cut and crucible.....	11.75 to 12.00
Copper, heavy and wire.....	11.25 to 11.50
Copper, light and bottoms.....	10.50 to 10.75
Brass, heavy.....	7.75 to 8.00
Brass, light.....	6.50 to 6.75
Heavy machine composition.....	10.25 to 10.50
Composition turnings.....	8.50 to 8.75
Clean brass turnings.....	7.75 to 8.00
Lead, heavy.....	4.20 to 4.25
Lead, tea.....	3.95 to 4.00
Zinc scrap.....	4.25 to 4.30

Chicago

CHICAGO, May 16.

The market for metals continues practically on

the same level as for the past few weeks, with buyers purchasing only for immediate consumption and new inquiries scarce. Copper is weak and the price of lead has declined five points. Tin is very erratic, although the price quoted is the same as for the past week. The market for old metals is lifeless. We quote Chicago prices as follows: Casting copper, 12 $\frac{3}{4}$ c.; lake, 12 $\frac{1}{2}$ c., in carloads, for prompt shipment; small lots, $\frac{3}{4}$ c. to $\frac{3}{8}$ c. higher; pig tin, carloads, 43c.; small lots, 45 $\frac{3}{4}$ c.; lead, desilverized, 4.35c. to 4.40c. for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2 $\frac{1}{2}$ c. per 100 lb. higher; spelter, 5.35c. to 5.40c.; Cookson's antimony, 10 $\frac{1}{4}$ c., and other grades, 9c. to 10c., in small lots; sheet zinc is \$7.25, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12c.; copper bottoms, 10c.; copper clips, 11 $\frac{3}{4}$ c.; red brass, 10 $\frac{1}{4}$ c.; yellow brass, 9c.; lead pipe, 4 $\frac{3}{8}$ c.; zinc, 4 $\frac{1}{4}$ c.; pewter, No. 1, 27c.; tin foil, 33c.; block tin pipe, 36c.

Iron and Industrial Stocks

NEW YORK, May 17, 1911.

The stock market drifted the greater part of the past few days but on Tuesday of this week prices decidedly stiffened, following the United States Supreme Court decision in the Standard Oil case, made public on Monday. This decision was regarded as distinctly favorable to such large corporations as are not engaged in any attempt to restrain trade unreasonably. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalmers, com.	7 $\frac{3}{4}$	Railway Spr., com.	32 $\frac{1}{2}$ -33 $\frac{1}{2}$
Allis-Chalmers, pref. 27	-29	Railway Spr., pref.	100 $\frac{1}{2}$ -101
Beth. Steel, com.	31 $\frac{1}{2}$ -32 $\frac{1}{2}$	Republic, com.	29 $\frac{3}{4}$ -31
Beth. Steel, pref.	60 $\frac{1}{2}$ -62	Republic, pref.	93-95
Can, com.	11 $\frac{1}{2}$ -12 $\frac{1}{2}$	Sloss, com.	49-49 $\frac{3}{4}$
Can, pref.	85 $\frac{3}{4}$ -87 $\frac{3}{4}$	Sloss, pref.	112
Car & Fdry, com.	52-54	Pipe, com.	16 $\frac{1}{4}$
Car & Fdry, pref.	115 $\frac{1}{4}$ -117 $\frac{1}{4}$	Pipe, pref.	55
Steel Foundries	41-43	U. S. Steel, com.	74 $\frac{3}{4}$ -77
Colorado Fuel	30 $\frac{1}{2}$ -31 $\frac{1}{2}$	U. S. Steel, pref.	118 $\frac{3}{4}$ -119 $\frac{3}{4}$
General Electric	155 $\frac{1}{2}$ -160	Westinghouse Elec.	68-72 $\frac{1}{2}$
Gr. N. ore cert.	59 $\frac{1}{2}$ -62	Va. I. C. & C.	60-62
Int. Harv., com.	125 $\frac{1}{2}$ -128 $\frac{3}{4}$	Am. Ship, com.	70
Int. Harv., pref.	126-127	Chic. Pneu. Tool.	49 $\frac{1}{2}$ -52 $\frac{1}{4}$
Int. Pump, com.	38 $\frac{1}{2}$ -40	Cambridge Steel	45 $\frac{1}{2}$ -46
Int. Pump, pref.	88-88 $\frac{3}{4}$	Lake Sup. Corp.	29 $\frac{1}{4}$
Locomotive, com.	37 $\frac{1}{2}$ -38 $\frac{1}{2}$	Pa. Steel, pref.	105 $\frac{1}{4}$ -106
Locomotive, pref.	106-106 $\frac{1}{2}$	Crucible Steel, com.	13-13 $\frac{3}{4}$
Nat. Enam. & Stamp, pref.	86	Crucible Steel, pref.	80 $\frac{1}{4}$ -81 $\frac{1}{2}$
Pressed Steel, com.	32 $\frac{1}{2}$ -33 $\frac{1}{2}$	Harb. Walk Ref., pref.	96

Dividends.

The Republic Iron & Steel Company has declared the regular quarterly dividend of 1 $\frac{3}{4}$ per cent. on the preferred stock, payable July 1.

The American Iron & Steel Mfg. Company has declared dividends of 2 per cent. on the preferred and common stock, payable June 1.

The Standard Chain Company, Pittsburgh, Pa., has declared a quarterly dividend of 1 per cent. on the preferred stock, payable June 15.

The Steel Corporation to Be Investigated

The House of Representatives on May 16 passed the Stanley resolution for the investigation of the United States Steel Corporation. The committee on rules named the following members as a special committee to conduct the inquiry: Democrats—A. O. Stanley of Kentucky, Charles L. Bartlett of Georgia, Jack Beall of Texas, Martin B. Littleton of New York and Daniel J. McGillicuddy of Maine; Republicans—M. E. Olmstead of Pennsylvania, Olin Young of Michigan, John A. Sterling of Illinois, and Henry G. Danforth of New York.

The resolution was adopted without much debate and with no opposition. The primary purpose of the inquiry is to determine whether the United States Steel Corporation or other corporations or persons have violated the anti-trust, inter-State commerce and other acts. The organization and operation of the Steel Corporation and its relations with the Pennsylvania Steel Company, the Cambria Steel Company, the Lackawanna Steel Company, the Pennsylvania Railroad Company, and with coal companies, national banks, trust and insurance companies, and any other interests are all to be investigated. Mr. Austin, a Republican from Tennessee, urged caution in disturbing the business interests of the country, and said that the absorption of the Tennessee corporation had been of advantage to the South. Mr. Mann, minority leader, said

that the Republican side would not obstruct the investigation, and hoped that it would result in benefit to the country.

Personal

Clarence A. Bartlett has accepted a position with the Garry Iron & Steel Company, Niles, Ohio, as sales agent traveling out of Philadelphia and working through the States of New Jersey, Maryland, Virginia, Pennsylvania and Delaware.

L. A. Irwin, formerly purchasing agent of the Quincy, Omaha & Kansas City Railroad, is now associated with the Western Railway Supply Company, Kansas City, Mo.

E. G. Eldridge, formerly with the E. L. Essley Machinery Company, Chicago, has severed that connection to engage in business for himself, in new and second-hand machine tools. He has opened an office and store at 566 Washington boulevard, Chicago.

L. A. Osborn of the J. M. & L. A. Osborn Company, Cleveland, Ohio, has decided to lay aside business cares for an indefinite period for the benefit of his health. He will spend some time in the South, where he is at present, and during the summer will go to Europe.

The Burt Mfg. Company, Akron, Ohio, recently received an order from Stone & Webster, engineering corporation, Minneapolis, Minn., for five 12-in., twelve 48-in. and two 60-in. ventilators. They will be made of Toncan metal.

The Chicago office of the J. E. Marshall Company, representative of the George H. Smith Steel Casting Company, Milwaukee, has been removed from 40 Dearborn street to room 755, First National Bank Building, Chicago.

David Evans & Co., The Rookery, Chicago, have been appointed exclusive Western sales agents for the Otis Steel Company, Cleveland, Ohio, in the sale of its open hearth steel castings.

Charles C. Gano, who was formerly connected with the sales force of J. K. Dimmick & Co., at Uniontown, Pa., has been appointed assistant manager for that firm at Cincinnati, Ohio.

Frank Samuel, Philadelphia, Pa., returned May 13 from a month's business trip abroad.

B. S. Harrison, of London, representing Sota & Aznar, producers of Spanish iron ore, arrived in this country May 13 on a business errand.

C. E. Swenson has been appointed assistant sales agent of the Hazard Mfg. Company in its Pittsburgh office in the Conestoga Building. He was formerly connected with Lee C. Moore & Co., consulting engineers.

H. D. Miles, of the Buffalo Foundry Company, Buffalo, N. Y., has been spending some weeks in Europe.

Edward Bailey, president of the Central Iron & Steel Co., Harrisburg, Pa., is recovering from a severe illness involving a surgical operation.

Powell Stackhouse has sailed for Europe. He will attend the international iron and steel conference at Brussels early in July as a director of the American Iron and Steel Institute.

E. A. S. Clarke, president of the Lackawanna Steel Company, sails for Europe May 27. He will make a tour of England before attending the Brussels conference of iron and steel manufacturers.

E. A. McKelvey, formerly Pittsburgh salesman of the Harbison-Walker Refractories Company, and R. A. MacDonald, formerly its Western Pennsylvania and Ohio representative, have severed their connection with that company and have been made sales managers for the Pittsburgh and Western territory for the General Refractories Company. The general sales offices will be suite 1243 Oliver Building, Pittsburgh, Pa.

Frank B. Ward, for several years in charge of Manning, Maxwell & Moore's Cleveland office and afterward manager of the Pittsburgh and Cleveland offices of the Niles-Bement-Pond Company, has opened an office in room 1203 Machesney Building, Pittsburgh, as the representative of Henry Pels & Co., New York, manufacturers of punching and shearing machines, also of the Nazel Engineering & Machine Works, Philadelphia, manufacturer of Beche patent pneumatic forge hammers, H. B. Underwood & Co., Edwin Harrington, Son & Co., of Philadelphia, and others.

Blast Furnace and Coke Oven Gases

The Results of Their Increasing Utilization at German Iron and Steel Works

BERLIN, May 4.—The Spring meeting of the Verein Deutscher Eisenhüttenleute, which was held at Duesseldorf on Sunday, April 30, and was unusually well attended, called forth two highly interesting papers on power and other problems in the iron and coal industries. Chief Engineer H. Hoff, of Duedelingen, spoke on "Important Problems in Connection with Supplying Iron Works with Furnace Gas." A considerable part of the furnace gases, he said, is required for heating the blast; the rest is available for generating power. The statements of engineers regarding the amount of gas needed for heating the blast vary greatly; but this is due chiefly to the difficulties in making accurate measurements of consumption, while local circumstances do produce some real variation. The speaker recommended the general introduction of efficient measuring instruments in order to secure accurate information regarding the economic advantages of the various methods of heating and power development.

Engineers are by no means agreed to-day, he said, as to the best method of generating and transmitting power in iron works, and the disagreement is greatest in respect to power for driving rolling mills. The speaker had circularized the great iron companies of Germany and Luxemburg which have electrical generating plants, and from the 29 answers received he concluded that an average of 38 per cent. of the power of the gas plants is utilized. Some plants utilize little above 22 per cent., while one gets 51.7 per cent. This difference is due to the secondary machinery; there are only two larger motors, each of 325 h. p. and these drive centrifugal pumps. One plant with 85.9 per cent. utilization is a steam plant. Corresponding to the degree of utilization, the allowance for interest and amortization is relatively high, reaching with some works $\frac{1}{2}$ cent per kw. hour when the allowance for those purposes is 15 per cent. The utilization can be increased by using turbine aggregates capable of carrying an overloading up to 50 per cent.

Steam Turbines vs. Gas Engines

Mr. Hoff announced it as his conviction that electric current can be produced more cheaply with steam-turbines than with gas motors, and he went into great detail to prove this. As a result of his investigations he expressed grave doubt whether iron works should resort to electrical transmission so extensively as is done at present by most of them, particularly in view of the progress being made in rendering the steam engine more economical in operation. He also drew attention to the fact that German engineers, as a consequence of the development of the large gas motor, have apparently lost interest in efforts to improve steam plants; for, in establishments with great electrical generators driven by gas engines it is often found that their boilers are operated at a pressure of only 5 or 6 atmospheres, and that superheating is done only to a limited extent. Owners of antiquated steam plants are seldom willing to displace them with modern, economically working machines. The best steam plants are found at the smaller rolling mills. Quite recently, however, a change can be seen. One can now hear of establishments ordering steam engines which had hitherto adopted the principle of running everything by electricity.

The speaker next took up the subject of utilizing furnace gas under boilers. Special precautions must be taken, he showed, for preventing gas waste in burning. With boilers equipped for burning gas more importance is attached to the system used and to the flame flues than is the case with boilers fired with coal, owing to the lower calorific efficiency of the burning gas. The speaker also referred to the merits of the expansion turbines, which have been much under discussion of late, and described a plant that has been in operation at Duedelingen for a year, utilizing the exhaust steam from the steam turbine.

Utilizing Coke Oven Gas

The second paper referred to was read by F. W. Lührmann, of Berlin, and treated of the utilization of gases in iron works and coking plants. He referred, among other

things, to the enormous excess of gas production at coking ovens above the demand for illuminating gas. This excess he estimates for the Dortmund mining jurisdiction alone at 1,800,000,000 cubic metres, and for all Germany at 2,400,000,000 cubic metres a year. He suggested that, in view of the high heating value of coke oven gas, iron works would find it to their advantage to heat their coke ovens with inferior gas, like blast furnace gases, and reserve their coke oven gas for their heating furnaces and open-hearth furnaces. German cities have latterly begun to obtain their gas supply from coking plants. According to this speaker, ovens heated by their own gases require only half of their product for this purpose. The surplus is sold to the cities at 2.25 to 2.50 pfennigs per cubic metre (0.409 to 0.455 cent per cubic yard). Thus half of the gas, along with the by-products of coal tar and sulphate of ammonia, gives a yield of about \$1.30 per ton of coke produced.

At this meeting various investigations undertaken by the association were referred to. It has proposed to the Ministry of Public Works the appointment of a special commission to study the utilization of blast furnace slag in making concrete. The Association is also engaged in experiments for determining the manganese contents of irons and ores.

Iron and Steel Works as Buyers of Coal

In connection with the utilization of gas for power purposes at iron works, it is highly interesting to note that the Coal Syndicate is not a little concerned about the reduction in the consumption of coal thus occasioned. In its annual report for 1910, which was given out this week, the Syndicate says, in explaining the smaller increase in coal than in coke consumption: "The technical progress in the utilization of gas, which has made it possible to use blast furnace gases for power purposes to an ever-increasing degree, has enabled iron works to give up the use of coal for fuel purposes more and more. Inasmuch as the iron works were formerly among our heaviest consumers of coal, and in view of the fact that the technical experts are predicting that they will consume only coke at no distant day, we must count upon considerable difficulties in selling coal, now and in the future."

Financial Results of Technical Advances

The yearly report of the Düsseldorf Chamber of Commerce, issued a few days ago, contains some noteworthy remarks about the financial effects of the technical improvements introduced by German iron works within the past few years. Those improvements, the report shows, have had a remarkably favorable effect upon the earning capacity of the iron companies. The prices of iron in 1910, it says, "were on an average 25 per cent. to 30 per cent. lower than those of 1906 and 1907, and only 5 per cent. to 10 per cent. higher than those of 1909. The good earnings of the great iron works were therefore due only in part to higher prices and larger outputs. Substantial results were produced by the improvements carried out in the dull years 1908 and 1909. The gross profits of the Hasper Eisen und Stahlwerke, for example, rose in one-year from \$214,000 to \$465,000, and a great part of this gain was due to the technical improvements introduced. That was the case at other establishments. Everywhere the companies have been modernizing, and they continue to modernize. The increasing utilization of blast furnace gas, in particular, has accomplished extraordinary economies."

Large Contract for Scales.—The Standard Scale & Supply Company, Pittsburgh, has secured a large contract for scales to be installed at the various pumping plants of the Department of Water Supply, Gas and Electricity, Borough of Brooklyn, N. Y. These scales aggregate 35 in number and include several 100-ton 42-ft. railroad track scales, both pit and suspension pattern, and a large number of wagon scales of 10-ton capacity, heavy railroad pattern. All these scales are to be built in steel and concrete construction. The contract will be completed during the summer. This is one of the largest installations of high capacity scales ever placed.

The Infallible Man

Instructive Reading for the Iron Man Who Speculates

The following article, taken from the New York Evening Post, will probably interest quite a number of our readers who pay some attention to speculation in stocks as a diversion from their cares in the manufacture of iron and steel:

A tender customer who was neglecting his silk business to speculate in stocks one day met a friend whom he had known casually for many years as a man who got his living in Wall street, between 10 a.m. and 3 p.m., and would never give a fellow a tip on the market. They went to lunch and regarded each other with mutual distrust. The tender customer wondered if the Wall street man got his living by ethical means, and the Wall street man wondered what the silk merchant was doing in Wall street.

"Business is dull with me," said the tender customer, apologetically, "and a friend I have with a Stock Exchange house got me interested in a little stock operation."

"It's a pretty hard market to beat," remarked the Wall street friend, as if there was nothing more to be said. The tender customer asked him what he thought of Steel common.

"I don't know what to think of it," said the Wall street man; "though I'm short of it I'm afraid there is too much company on the short side."

"I have sold it short," ventured the tender customer. "In the office where I have my account they are very bearish on it. There is a man in that office who, I am told, is an authority on the steel trade. He seems to know a great deal. He says—"

"Who is he?"

The tender customer cast his eyes about to make sure that nobody was listening and then mentioned the name of the steel trade authority as if in confidence.

"Oh!" said the Wall street man. "He's now with that house, is he?"

"Yes," replied the tender customer. "I don't know whether he is a member of the firm or not. The head of the house seems to be very proud of him—refers to him continually on questions of Steel."

"No," said the Wall street man, "he is not a member of the firm. He is just trading there. No doubt the firm gives him an interest in the market for his information."

"You know about him, then?"

"I have known him for years."

"He's very well posted on steel-trade conditions, is he not?"

"He is," returned the Wall street man. "He knows the steel trade thoroughly. He sits up nights with it. I think he must have been raised on pig iron. He understands it chemically, mineralogically and commercially. The only other thing he knows is his way home and back."

"I'm glad to hear you say so," said the tender customer. "Since I sold Steel it has gone up two points. So he is really an authority, then?"

"His knowledge of trade conditions is amazing, really," said the Wall street man. "You will notice that when he leaves Wall street in the afternoon he takes with him all that has been contributed during the day to the literature of steel, together with material of a heavier sort—the foreign trade statement, the Statistical Abstract of the United States, or the annual reports of the United States Steel Corporation. He reads every line of *The Iron Age* each week. He can give you the statistics of pig-iron production by months for years past out of his head. He knows every steel-making process there is, and the cost of producing anything from a ten-penny nail to a steel rail. It's marvelous what he knows about steel and iron. I believe he was once in the steel business. On trade conditions he is infallible."

"Well," said the tender customer, "he is very bearish on Steel common. You think yourself it will go down, don't you?"

"I can't see anything in conditions to put it up," said the Wall street man.

The tender customer went back to the house where he had his account, offered the steel authority a good cigar, and got in return the story of how the steel authority

disapproved of the formation of the United States Steel Corporation, and told Mr. Morgan and others how it was going to turn out. Did he tell them personally? Well, not exactly; but he told everybody else and wrote letters to the newspapers which no paper dared to print at that time. Also, he wrote a series of circulars for a large Stock Exchange house predicting the slump which took place in the Steel shares.

The man whom the tender customer knew as one who got his living in Wall street went back to his office and gave orders to buy all the Steel common he was short of.

"Do you know anything?" asked the broker in surprise. "I thought you were very bearish on Steel."

"I have been," said the man who got his living in Wall street. "I am bearish on it still, but I'm wrong."

"What makes you think so?"

"I've been talking to a lamb."

"One who was bearish on Steel?" inquired the broker.

"Worse than that. He had been selling Steel common short on the advice of the only infallible man in Wall street."

A month afterward the tender customer who had been neglecting his silk business met his Wall street friend uptown. "Our authority was not infallible this time," he remarked. "I lost nearly ten points in that Steel common I sold short."

"But our friend is infallible, all the same," said the Wall street man.

"I don't know what you mean," said the tender customer. "He certainly was very wrong on Steel common."

"That's what I mean," answered the Wall street man. "He is infallibly wrong."

"But you said yourself that he was undoubtedly an authority on the steel trade."

"He is, but Steel common is always nine months or a year ahead of him, and he never catches up with it. He has been running that race for ten years."

"Why couldn't you have told me before?"

"Steel might have gone down."

"What do you think of it now?"

"I don't know what to think of it."

"That's what you said before," complained the tender customer. "Why is a speculator like yourself so unwilling to give an opinion?"

"You are in the silk business?" asked the Wall street man.

"Yes."

"Well, then, perhaps you can tell me if silks are going to rise. I should like to buy if they will rise."

Ottawa's Advantages.—The Publicity and Industrial Bureau of Ottawa, Canada, has issued a beautifully illustrated brochure calling attention to the economic and advantageous facilities for the successful operation of nearly every kind of industry which are offered by the city of Ottawa. The Chaudiere Falls of the Ottawa River, located within the city limits, provide an abundance of cheap electric power, approximately 73,000 hp. being at present utilized, with 27,000 hp. available. On the same river, above the city, 589,320 hp., and below the city 269,680 hp. are capable of development. The claim is made that the city is in possession of more power than Niagara, and at less cost. A list of 168 factories is given which shows the great diversity of the local industries.

The Jones Step Process.—The Kloman Mining Company has decided to install at its property in the Republic district of the Marquette range three furnaces of the Step process type, of which John T. Jones is the inventor. The equipment for the plants is now arriving from the shops of the Allis-Chalmers Company. The construction of the furnaces will differ somewhat from that employed in the experimental plant at Iron Mountain, Mich., Mr. Jones' home city. The most noticeable radical change will be in the cylindrical kiln, the position of which will be horizontal instead of inclined. The capacity of the furnaces will range from 200 tons to 400 tons of "metalized" ore in 24 hours.

R. A. Rowland & Co., Bessemer Bldg., Pittsburgh, has secured a contract for the cast iron, ornamental iron and brass work for a new depot for the Pennsylvania Railroad at Steubenville, Ohio, which will be 50 x 200 ft. in size.

The Selection of Factory Equipment

Considerations Bearing on the Economical Installation and Operation of Machinery

BY STERLING H. BUNNELL.

In looking over a well designed factory, with material traveling forward on regular routes, workmen actively employed at all times, supplies furnished as required without delay and light, power and all facilities supplied in full measure and without interruption, there is little evidence of the elaborate process of investigation which precedes getting the equipment and putting it in working order. One of the most difficult problems which must be solved by the manager or engineer taking hold of a factory problem is the planning of the equipment to handle the work to the best advantage. The steps to be followed in the case of a new factory intended to take over the work of one already in operation are easily determined. If, however, an old factory is to be purchased and adapted to handle new work, much more study is necessary than if the whole problem began with a sheet of blank paper. The most difficult of all situations is to lay out the work in connection with a new machine or process which has never before been handled in a shop, and which therefore cannot be reduced to practice on the lines of what someone else has done. It is always easy to take another man's ideas and do better than he did. It is quite another matter to start in the first place with no information at all and establish a scheme so good that the second man cannot pick holes in it at the first glance.

Things to Be Decided First

Taking up the work at the beginning, the first step is to go over the machine or process in detail, item by item, and estimate the kind of machine, character of labor and time element necessary to complete each operation in detail. If the work is the construction of a small machine in one size only a list of parts of the machine taken from the drawings is the starting point. Each part is then to be studied and the best method of construction determined and set down. The size of machine which it is proposed to use and the time required for the operation should be put down each in its proper column. A complete list of job time is thus prepared. A series of totals is taken of the list when completed, so that the total of minutes or hours time for each size of machine tool may be determined. The desired output of the factory in units of product per day being known, it is easy to determine how many machines of each type will be required to produce the necessary number of each part.

At this point an element of judgment comes in. Some machines will be found to have idle time, as where the number of operations for one machine is not enough to keep it busy for a full day while turning out its quota of the day's output of the factory. The planner does here just what the foreman would do in an actual factory. He endeavors to see if he can shift some of the work from tools of near the same size, or whether he can increase the speed of machines when necessary so that they can finish within the scheduled time.

Standard vs. Special Machines.

The difficult operations and the most expensive items of work need the most careful study. Some of these operations may be found to form the centers around which all the shop work may be said to revolve. If a special machine is required to perform some one operation the output of the entire factory may be measured by the capacity of this machine to do work. In selecting the types of machine for difficult or special work too much thought cannot be given to arranging to use standard tools and devices rather than special construction. While there are cases where special machines are desirable, it is much more often advisable for the one planning the work to arrange for special devices to be applied to standard machines so as to avoid the purchase of expensive machinery which will represent too large a proportion of the invested capital and which cannot be readily shifted to other work. Among machine tools some of the special turret lathes which have been advocated universally for work which was formerly

done on engine lathes are being replaced to advantage by lathes of simpler types provided with automatic stops. A cheaper and stronger machine is thus put within the capacities of semi-skilled help. Such lathes can be "set up" by a foreman in the same way as is common practice with turret lathes and screw machines, and unskilled men can easily be taught to run them, the accuracy of the work being secured by proper setting of the automatic stops.

In putting new work into an old shop purchased for the purpose it is worth while to go over the whole ground from the beginning, just as if the shop were new, and then to compare the schedule of tools and see where discrepancies occur. Naturally, having certain machines on hand, there will be more opportunity for revising the first schedule and shifting some kinds of work to other tools than those for which they were first intended, so as to utilize the facilities as far as possible. Managers are recognizing more in these days the value of time spent in careful planning before starting to spend money upon equipment which cannot be changed. A few days and the necessary expense put into the careful study of a manufacturing problem cannot fail to realize much more in the way of profit than the same amount spent in a machine which later proves to be unsatisfactory and loses money from first to last.

Sequence in Ordering and Installing Machines

When the time comes for the actual purchase of the new machinery the management should remember first that it will be impossible to commence work on all of the machines on the same day. There are always successive steps to be performed in every manufacturing operation. The purchaser should therefore ascertain which machines he can probably get soonest and should work with the men concerned in fitting up the tools, making the necessary fixtures and commencing the construction of factory product, so that they may make ready to use the machines as soon as they come in. In setting up a large factory much interest may be saved by careful planning in this way. Some of the machines first purchased can be put to work making fixtures for others. In machine work some of the lathes intended for manufacturing may be started as toolmaking machines and afterward transferred as the volume of toolmaking work decreases, which will often be the case where large quantities of jigs must be made up in advance for a machine which will afterward remain with little change.

A Tendency To Too Heavy Machines

Considerable saving can often be made in purchasing tools, if the craze for extra weight is kept in check, where this is justifiable. Machine tool builders sometimes persuade purchasers to take extra heavy patterns of tools, when in fact the work which will be put on the tools is not of a character which permits of using their full power. In a forge shop the heaviest possible pattern of lathe is justifiable for taking very heavy cuts on rough orders; but the same type of lathe would not be desirable for finishing crank shafts in a machine shop, since the shafts are not stiff enough to permit of using the full power of such a tool. There are excellent special machines made for such work as the turning of crank shafts; but while they work with great speed and accuracy, they are naturally not constructed with the same character of strength and rigidity as is necessary in ripping off the steel from a rough forging. There are boring mills on the market capable of taking the heaviest kind of a cut at the greatest speed possible for the steel, on the outside of the full diameter of which the machine is capable. Such tools, however, are not desirable for shops where nine-tenths of the machine's work is to be done on small diameters. In many cases, careful preliminary thought will show how to save unnecessary outlay, and where the shop can better afford to lose a little time on occasional large work than to suffer a constant loss through the fixed charges connected with a heavy and expensive tool worked to only half its capacity.

In planning a factory, it is always necessary to provide liberally for growth. This requires a quality of the imagination beyond that needed to determine the necessary tools for work in hand. The designer of the shop should consider whether, in purchasing a machine of, say, 40 in. diameter, he can provide, on the one hand, for the extreme of work which he may desire to take care of in the shop, or whether, on the other hand, he would not do well to buy a small machine in the first place and later add a larger one. A common fault of purchasers of shop equipment is to put in overgrown tools in the hope of being able to take care of anything which may be required. The result is that the tool is worked for years on small size, at continual disadvantage. The loss of profits on a tool poorly adapted to the work is enough in many cases to have covered at least the interest on the cost of another machine of smaller size, and often, indeed, will pay for the small machine in a short time.

Finally, in planning and purchasing, the management should be conservative, and endeavor to keep within the limits set by prudence in every direction. Not all the tools should be purchased in one order. Some capital should be reserved for additions. The most careful planning cannot foresee all the development of the future. Some machines will be found insufficient in output to meet the requirements. New devices will come to the notice of the construction department, which will put in requisitions for them, often calling for no small amount of money. All plans have a tendency to overrun the expected limits. By purchasing the small machines first, and keeping back portions of lots of machines of the same size, the man with limited capital is much more safe than with his last dollar spent on the purchase of equipment. The same consideration should hold with large and wealthy corporations, which are justified in purchasing to fill their needs, but which should always retain a generous reserve for the unexpected additions which success will require for the plant.

The American Foundrymen's Association

The following provisional programme has just been issued for the Pittsburgh convention of the American Foundrymen's Association, May 23 to 26. The sessions will be held at the Pittsburgh Exposition building on Duquesne Way, in which will be shown the exhibits of the foundry supply and machinery firms. The "joint sessions" referred to are those held in conjunction with the American Brass Founders' Association. The latter association holds a separate session on Wednesday afternoon, also one for the election of officers on Friday morning.

MONDAY, MAY 22

2 P. M.—Registration Only.

TUESDAY, MAY 23

9 A. M.—Registration.

10 A. M.—Joint Session.

Addresses of Welcome, Presidential Addresses, Reports of Secretaries, Committees, etc.

"Economical Insurance for Foundry Properties," by S. G. Walker, Providence, R. I.

"Production Costs," by Ellsworth M. Taylor, New York.

"The Efficiency Movement in the Foundry," by C. E. Knoepfel, New York.

"Foundry Costs," by F. E. Webner, New York.

"Why Cost Systems Fail," by S. E. Nold, Alliance, Ohio.

Presentation of Molding Sand Data of the A. F. A.

Memorandum on the Standard Test Bar for Cast Iron.

2 P. M.—A. F. A. Session.

"Cupola Melting Practice," by P. Munroth.

"Cupola Practice," by R. H. Palmer, Salem, Ohio.

"The Briquetting of Metal Borings," by Dr. R. Moldenke, Watsch, N. J.

"Mechanical Charging of Cupolas," by G. R. Brandon, Harvey, Ill.

"Progress in Heated Foundry Mixers," by J. B. Nau, New York.

"Titanium in Iron Castings," by Chas. V. Slocum, Pittsburgh.

"Defective Castings, and how to Handle Them," by John M. Perkins, St. Louis.

"Molding Machine Practice," by E. H. Mumford, Plainfield, N. J.

"Machine vs. Hand Molding," by John Alexander, Philadelphia.

WEDNESDAY, MAY 24.

9.30 A. M.—Joint Session.

"The Permanent Mold," by Edgar A. Custer, Philadelphia, Pa.

"The Foundry at Close Range," by Benj. D. Fuller, Cleveland, Ohio.

"Core Making and Core Machines," by Archie M. Loudon, Elmira, N. Y.

"Core Room Practice," by F. A. Coleman, Cleveland, Ohio.

"Recent Developments in Pyrometry," by S. H. Stupakoff, Pittsburgh.

"Recovery of Foundry Waste," by S. A. Capron, Westfield, Mass.

2 P. M.—Steel Session.

"Open Hearth Steel Foundry Practice," by R. E. Bull, Granite City, Ill.

"The Manufacture and Annealing of Converter Steel Castings," by Bradley Stoughton, New York.

"The Small Open Hearth Furnace for Steel Castings," by Walter MacGreggor, Chicago.

"The Practicability of the Induction Furnace for the Making of Steel Castings," by C. H. Von Baur, New York.

"The Electric Furnace for Steel Castings," by Dr. P. Heroult, New York.

"Microscopic Structure of Iron and Steel," by Prof. Wm. Campbell, New York.

"Titanium in Steel Castings," by Chas. V. Slocum, Pittsburgh.

"Vanadium in Iron and Steel Castings," by G. L. Norris, Pittsburgh.

THURSDAY, MAY 25.

9:30 A. M.—Joint Session.

"Foundry Construction," by Geo. K. Hooper, New York.

"Electric Motor Drive for Foundries," by Brent Wiley, Pittsburgh.

"The Rotary Blower for Cupola Use," by R. H. Rice, Schenectady, N. Y.

"The Application of Lifting Magnets for Foundry Work," by H. F. Stratton, Cleveland.

"Pattern Equipment," by W. S. Giele, Philadelphia.

"Titanium in Malleable Castings," by C. H. Gale, Pittsburgh.

"The Physical and Chemical Characteristics of Malleable Iron," by W. P. Putnam, Detroit, Mich.

"The Equipment of Air Furnaces Using Oil as Fuel," by N. W. Best, New York.

1 P. M. Train excursion to foundries and steel works. (Pa. R. R. Union Station.)

8 P. M. Entertainment by Foundry & Machine Exhibition Company to members, ladies and guests attending the convention.

FRIDAY, MAY 26.

9.30 A. M.—A. F. A. Session.

"Gas Cavities, Shot and Chilled Iron in Iron Castings," by Thos. D. West, Cleveland.

"Manganese and Silicon in the Foundry," by A. E. Outerbridge, Jr., Philadelphia, Pa.

"Instruction Paper on Phosphorus," by H. E. Field, Pittsburgh.

"The Foundry Foremen's Educational Movement," by D. O. Wilson, Newark, N. J.

Election of officers and concluding business.

3.30 P. M.—Pittsburgh and Cincinnati Ball game at the Million Dollar Forbes Field.

6.30 P. M.—Subscription dinner open to all who attend the convention.

The visiting ladies will be specially entertained by a special committee.

Railroad Equipment Orders.—In addition to the 500 refrigerator cars already reported as ordered by the Burlington, it has placed 100 gondolas with the American Car & Foundry Company. The Key West Route of the San Francisco, Oakland & San Jose Railway has ordered 25 motor coaches and trucks from the St. Louis Car Company, St. Louis. The Merchants Despatch Transportation will build 100 refrigerator cars at its shops and is taking prices on 1000 additional refrigerator cars. Among pending inquiries are the following: Cambria & Indiana, Philadelphia, 200 all-steel hopper cars; Seattle Mfg. Company, 50 hopper cars; Grand Trunk, 1000 box cars; Duluth, Rainy Lake & Winnipeg, 250 box cars and 100 flat cars; Canadian Pacific, 1000 to 2000 box cars and 300 to 500 gondola cars. The Grand Trunk is in the market for 136 locomotives. The Atlantic Coast Line has ordered placed 35 locomotives with the Baldwin Locomotive Works.

The National Clock & Electric Mfg. Company, St. Louis, Mo., states that its factory was damaged by fire April 22 to the extent of \$18,000 to \$20,000. The company manufactures thermostatic instruments, making a specialty of oven thermometers. It has been compelled to move to 1906 Pine street, owing partly to the damage done to its building and partly to the necessity for occupying larger quarters so as to meet the constantly increasing demand for its products. The insurance inspectors, after making a thorough investigation, attributed the origin of the fire to a lighted cigarette, spontaneous combustion or the crossing of wires.

The Mumford Molding Machine Company, Plainfield, N. J., has just issued a loose leaf sheet catalogue illustrating its line of molding machines for foundry work and including jolt ramming machines, split pattern machines, power squeezers and pneumatic vibrators.

American Machinery in Europe

A Recent Study of the Situation Is Encouraging to Manufacturers of Machine Tools—Agencies and Prices

BY C. A. TUPPER.

Returning from a three months' trip through all of the important industrial districts of Europe west of Russia and north of Buda-Pesth, I can summarize the situation as one most favorable to the further extension of American trade in machinery of every description, for metal working and allied branches. It is now a fact well recognized that, with the extensive domestic market open to them, American manufacturers have developed specialties in machinery construction to a far greater extent than those of any other nation, particularly in the line of high speeds, large capacities per unit of labor, easy control and automatic or semi-automatic operation. This specialization, with its accompanying changes in shop methods, European users were slow to appreciate in the beginning, but in recent years they have seen its advantages. The increasing cost of labor has forced the very general adoption of American labor-saving methods and machinery, with consequent necessity for the purchase of the latter by concerns that can find no equivalent or reasonably satisfactory substitute for it among their home producers. It is also freely admitted abroad at this time that the tendency of many American manufacturers to limit their activities to one tool, or one special line of machinery, has resulted in a degree of efficiency not ordinarily reached by manufacturers abroad, who must depend upon a wide range of demand from a limited field—limited both geographically and by racial prejudices. It is necessary, therefore, for the latter to turn out numerous distinct varieties of apparatus in order to keep their shops working to capacity.

The High Standing of American Tool Builders

For many years there has been dinning into the ears of Americans, and with good reason, the tale of our deficiencies in catering to export trade. It is, therefore, extremely gratifying to find in every industrial center of Europe evidences of the really efficient, trustworthy work done abroad by American machine tool builders. If our national reputation in Europe, as designers and reliable manufacturers of machinery, depended upon this class of trade alone it would stand very high. I found represented in installations no less than 113 American builders of machine shop equipment and many additional concerns furnishing other apparatus identified with the metal working industries, including pattern making machinery, foundry equipment, pneumatic appliances, electric power and pumping machinery—the last two, however, being represented by branches or affiliations of the principal companies operating in this country.

There is, of course, extensive imitation of American tools, both for wood and metal working. The best of these imitations have been brought out in Germany or Switzerland, and in not a few cases it is difficult to distinguish any inferiority. In fact, one meets with some undoubted improvements over American designs, due to characteristic Teutonic thoroughness in reducing all calculations to a mathematical certainty. As a rule, however, the imitations are merely imitations, not real equivalents, and there appears to be an increasing tendency on the part of European users to equip their shops with the most efficient American tools, even at considerably higher prices than would need to be paid for substitutes. Comments on the latter were, in most cases, accompanied by a shrug of the shoulders which left no doubt as to the speaker's opinion.

Agencies for American Tools

The sale of American tools in Europe is so largely in the hands of agencies that the proper selection of such representation by the American manufacturer is a primal element of profitable trade. Nor are his subsequent education and support of these agencies of less importance. The larger agencies, having their headquarters in the capital cities of Great Britain, France, Germany, Austro-Hungary, Russia and the Scandinavian countries and (note the

distinction) in the chief manufacturing centers of Italy, Switzerland, Spain, Holland and Belgium, are in the main treating American interests fairly and efficiently. This is also true of large European manufacturers who carry a stock of American tools non-competitive with their own and furnish complete shop installations. Many smaller agencies or individual agents located directly in industrial districts, each intensively cultivating a strictly limited territory, are, however, rendering very good service to American manufacturers; and in planning a new or extended campaign the possibilities of this class of representation should not be overlooked.

Great Industrial Activity Abroad

All through Europe, particularly in Switzerland, Germany and Belgium, I found the most pronounced activity in every line of industry, with many plants working two long shifts or three 8-hour shifts per day. There is a corresponding need of equipment of all kinds to meet current demands, and no American manufacturer having machinery which will save time and labor or otherwise effect economies in production should hesitate to place it before the European trade. He will find no better time for doing so. Any tool offered abroad, however, should possess unqualified merit. Of ordinary machinery, mediocre in quality, there is a great abundance in all European countries. Much of this class of equipment can be more cheaply produced there, especially when the differences in delivery charges are considered, and, other things being equal, the home product naturally has preference.

The matter of price is of far less importance than is generally supposed in this country. When a European selects an American tool he ordinarily does so because of its decided superiority to other makes and the saving in production that can be effected by its use is figured out to the last decimal. Having before him, therefore, the sum total of possible annual economy, on a conservative basis, he is willing to pay a fair price for the machine, and there is no good end gained by making undue concessions. The more American manufacturers adhere to the "one price" standard the more European users respect them. Considerable injury to our trade abroad has been done by the tendency of some tool builders on this side to get a footing in certain territory by means of low prices, and the present slackness in all lines here is having, in this respect, an unfavorable influence on American trade all through Europe.

Personal Cultivation of Trade

Some of the smaller American manufacturers of metal working machinery, machine tools in particular, have entrenched themselves in Europe to a surprising degree, and they are at present cultivating the field more thoroughly than the greater number of the large concerns. I met in numerous instances with the excellent results accomplished through visits of members of these firms, or special representatives from their works, and the demonstrations given by them of the efficiency of their machines. Tons of catalogue matter or correspondence, and any amount of ordinary selling effort, are not equal to one good demonstration, particularly if it can be made in the presence of the managing directors or superintendents of a number of plants in the district, with the close and comprehensive questioning which this is sure to bring out. It is, naturally, of great advantage if the demonstrator can speak the language of the country; but even that is not essential. Not only is English very generally understood abroad, but the sign language goes far in Europe and people there are adepts in comprehending it.

Outside of the line of the wood and metal working industries there are many other opportunities in Europe for the extension of American trade; but most of these, such as flour milling, timber cutting, ore and stone crush-

ing, concrete mixing, etc., would not interest the majority of readers of *The Iron Age*.

Power Equipment Lags

In relation to power equipment, which does have such interest, I found the situation unfavorable. Except in the matter of gas engines, the best American makes of which undoubtedly excel those of Europe both for simplicity of construction and economy of maintenance, the power and electrical machinery manufactured abroad is, in my judgment, fully equal or superior to the average of that produced in this country. The best work appears to be done in Switzerland, where an amazing degree of efficiency has been attained. From the first European plant visited, which was a wood working shop equipped wholly with American tools, in the island of St. Michaels, Azores, I found Swiss generators, motors, switchboards and other electrical apparatus, as well as steam and hydraulic turbines, engines, etc., more largely used than those of any other country. Apart from machinery of the European branches of the General Electric Company and the Westinghouse companies, American products in this line have a very limited representation in Europe. There are some Corliss engines in operation that were built in the United States, but I saw only one of recent make and this was from a "repeat" order based on the extremely satisfactory service of a similar engine installed years ago. One practically as good could have been purchased from shops in the same city at a very much lower price. It is noteworthy, however, that in the line of hydroelectric machinery European builders are now copying American types to the practical exclusion of their own earlier designs. In one large plant that I visited every important piece of work on the floor represented this tendency.

American steam driven pumps have heretofore commanded a fairly large sale in Europe, but Swiss and German manufacturers have been pressing them very closely during late years and the increasing use of motor driven pumps threatens to displace these types almost altogether. In the line of electrically operated pumps foreign manufacturers have taken the lead and our own best designs are mainly adaptations of European practice. Hence the sale of American motor driven pumps abroad, especially those of the centrifugal type, would appear to be like carrying coals to Newcastle.

Mining and Metallurgical Machinery

In the treatment of iron ore, the manufacture of coke, in steel making, etc., the flow of ideas and improvements in equipment has been, in the judgment of Europeans, from Europe to the United States, with very little of a return movement; but machinery in general for mining work and the recovery of values from metallic ores other than iron has been developed to a greater degree of efficiency in this country owing to the larger range of our experience. Hence the field for the sale of American mining and metallurgical equipment is very large. This might not be true if the continent of Europe only were to be considered; but the investments made by British and Continental capital in mining enterprises the world over, particularly in the colonies or other dependencies of European countries, lead annually to the purchase in London, Paris, Berlin, Hamburg, St. Petersburg, Vienna, Prague, Budapest and other large commercial centers of enormous quantities of machinery for their development and operation. Some of the leading American manufacturers, through branch houses and agencies, are securing a large part of this trade, and a portion of it is even placed directly in New York by representatives of European owners; but there is much more of the business that can be obtained by proper cultivation of the field abroad. Having been given exceptional opportunities of observing conditions I can state this most emphatically.

McDowell & Co., North Side, Pittsburgh, Pa., have recently completed a shipment of pipe from the oil fields of Indiana and Ohio, consisting of 13 miles of second hand and six miles of new pipe, sizes 4, 6 and 8 in., to the Wichita Falls Gas Company, Wichita Falls, Texas, and has an order from the same company for four more miles of pipe. McDowell & Co. for years have made a specialty of buying, repairing and selling second hand pipes, casing, tubing, rods, etc.

Customs Decisions

Mantel or Fireplace Castings

Although Congress, in passing the tariff act of 1909, liberalized the corresponding provision in the Dingley act of 1897 relating to iron castings, the Board of United States General Appraisers rules that mantels or fireplaces are not included in the category of castings within the meaning of the existing law. The collector at New York classified the articles as "not specially provided for, composed wholly of iron, partly or wholly manufactured," and imposed duty at the rate of 45 per cent. The importers, including Warren & Wetmore, the W. H. Jackson Company and the E. B. Currier Company, objected to the collector's classification, alleging in their protests that the merchandise is entitled to enter at 8/10 of a cent a pound, or at 1 cent per pound, under paragraph 147 as "castings of iron or cast-iron plates." The testimony shows that the articles are metal interiors or linings for mantels, made of cast iron in several sections. These are imported in sets, each piece of which has been fitted to the other, the respective parts being finished and ready to be set up to form the lining for the fireplace or the frieze for the mantel.

The decision of the board states that the goods are no longer mere castings of iron, or plates, having passed beyond that stage when the frieze or interior of the mantel was fashioned so as to fit together. The decision refers to the fact that the new law is perhaps more liberal in its treatment of castings than its predecessor, but holds that the words "but not made up into articles" appearing in paragraph 147 are fatal to the contention of the importers. In passing on the meaning to be given to the phrase "but not made up into articles," the board rules that it was a limitation so as to exclude three classes of articles: 1. An article made up of more than one casting, the separate parts of which are fitted and ready to be put together. 2. A casting joined or fitted as a part of something else. 3. A single casting which is a completed and usable article in itself. The decision concludes:

The merchandise here before us is excluded by reason of above limitation. The goods are interiors of mantels, etc., all ready and fitted for use, and have lost their character as "castings of iron." The real claim seems to be based on the fact that the goods are imported in sections, but that fact cannot alter the classification of the goods as completed manufactured articles. As well might it be said that the sections necessary to make a complete machine when imported collectively are entitled to be separately considered as castings. We hold the merchandise dutiable under paragraph 199, and overrule the claims at lower rates as filed in the protests.

Automobile Horns

It has been decided by the board that automobile horns and bulbs will have to pay duty as entireties. The test case stands in the name of the Motor Car Equipment Company, but the decision has general application to this line of articles. The horns are of metal while the bulbs are of India rubber, metal mounted. The appraiser of the port reported to the collector of New York that with each bulb is packed the remaining part of the horn, the two parts constituting a complete horn, of which metal is the component material of chief value. The collector assessed duty at 45 per cent. under the provision in the tariff for parts of automobiles, while the importer set up the contention that, as the bulbs are in chief value of rubber, horns and bulbs should be allowed to enter at 35 per cent. as manufactures of India rubber. In finding against the contention the decision says:

The record unquestionably shows that the bulbs are useless without the horns and that the horns cannot be used without the bulbs. They come packed together, and we do not believe it would be proper to separate for duty purposes such articles into parts subject to different classifications. The horns and the bulbs, therefore, are imported at the same time, and as each horn requires its bulb, so as to be available for use, it would appear to us that such articles when imported together constitute complete assembled articles subject to classification as entireties. We hold the merchandise dutiable at 45 per cent under paragraph 199 as manufactures of metal, and, as paragraph 141 levies this same rate, we affirm the collector's assessment.

The Homestead Valve & Mfg. Company, Homestead, Pa., has appointed E. D. Morton & Co. its agents in Louisville, Ky., and vicinity.

Tests of Steel at Watertown

A Study of Microstructure of Ingots and Rolled Products

The report of tests of metals made at the Watertown Arsenal during the fiscal year ending June 30, 1909, has recently been published. It appears in three volumes, containing in all 1044 pages. Volume 1 refers to the examination of Bessemer rail steel, from the ingot down to the finished rail. Volume 2 deals with finished Bessemer rails, also open hearth steel and rails and some electric furnace rails. Volume 3 contains steel column tests and miscellaneous material. This last comprises forged steel bars, drawn down in the direction of the length of the ingot, at different temperatures and with different amounts of reduction; also the examination of some locomotive fire box sheets, a number of tests of building stone from the West Virginia Geological Survey and some reinforced concrete columns. Among the columns were some fabricated at Chicago and at St. Louis on regular construction work and forwarded to Watertown, where the tests were made.

The report deals chiefly, however, with an examination of the material in thirty steel ingots, representing five acid Bessemer heats and is largely illustrative of the appearance of the metal as it was found in the ingot and in the various passes of the blooming and rail mills down to the finished rail. There were modifications in the treatment of the ingots, some being charged hot and soaked and rolled; others cooled in a vertical position, reheated and rolled, while in still other cases the ingot was laid on its

and what was taken to be detached ferrite appeared here and there. Some of the entrained slag globules were surrounded by ferrite and some were not. The metal at the edges of some blow holes was apparently decarburized, while in other cases it was not.

Different structures were brought to view when etched—one structure when etched with iodine and another when etched with picric acid, as shown by the reproductions in



Fig. 1.—Steel Ingot Structure, Etched with Iodine. Magnification, 3 Diameters.

side to cool immediately after stripping, then was reheated and rolled. The substance of some of the comments made in the report will be of interest.

Certain of the ingots were examined in that state, not having been rolled, after cutting up in the planer, in longitudinal and cross-section slices. Illustrations show the appearance of the sections before and after etching with iodine and notes were made of the slag inclusions. The upward flow of the slag in the ingot, before freezing, was shown by small buttons collecting on the lower surfaces of blow holes which were located in the upper end of the ingot. Slag entrained in the lower parts was in a finely divided state in the form of small globules.

The microstructure of the metal showed elongated crystals or grains next the sides of the ingot, while in the body the crystals were of a more regular form. Considerable diversity of size characterized the crystals and there were large crystals in close proximity to fine ones. The meshes surrounding the crystals were incomplete in many places

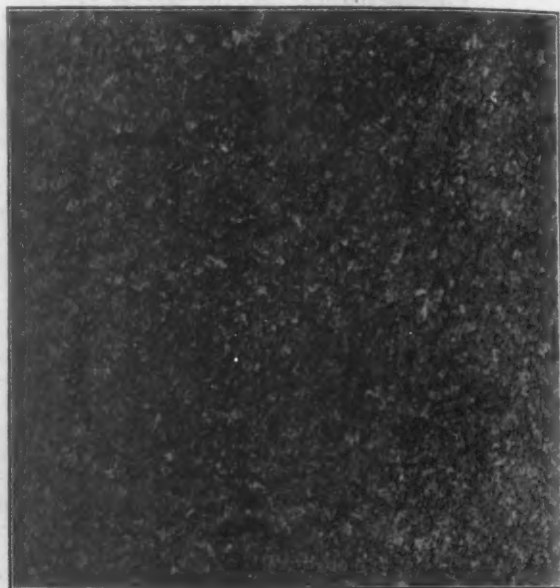


Fig. 2.—Steel Ingot Structure, Etched with Picric Acid. Magnification, 3 Diameters.

Figs. 1 and 2. Both structures were brought out on the same surface by first etching with one medium and then with the other, as in Fig. 3.

In the rolled shapes practically the entire metal of the ingot was used, discarding only the small part needed to get the metal safely through the rolls. It was observed that the blowholes were quite early obliterated, so far as they were visible to the eye, on the longitudinal slices into which the shapes were cut. The welding of the steel, whether more or less complete, was subsequently made the subject of special inquiry. The fractured ends of some tension test pieces were used, as illustrated herewith. A butt weld is shown in Fig. 4. The decarburized zone will be noted. Scarf welds when planed off below the decarburized surfaces showed little trace of the weld in the microstructure. Fig. 5 shows such a portion of the weld. From such an example it would appear that welding of the metal of these ingots could be accomplished very satisfactorily under favorable conditions, where the surfaces were neither oxidized nor decarburized.



Fig. 3.—Steel Ingot Structure, Etched with Both Iodine and Picric Acid. Natural Size.

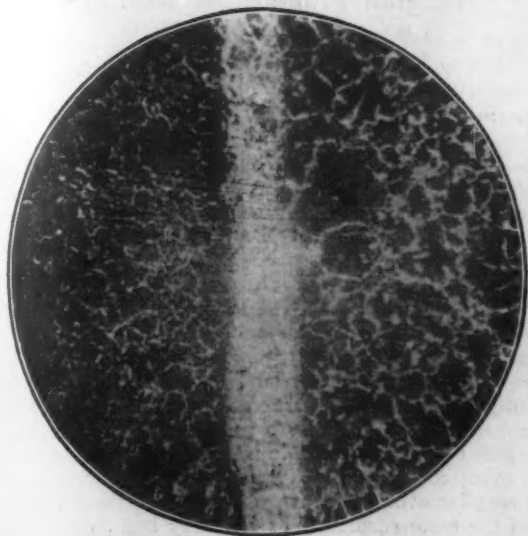


Fig. 4.—Butt Weld Made with Ends of Fractured Tensile Test Piece. Magnification, 62.5 Diameters.

Carbon determinations were made with drillings taken from axial longitudinal sections from the sixth and ninth blooming passes. The average carbon content appeared about 0.50 per cent. along the middle part of the ingot. The highest carbon noted was 0.85 per cent. about one-quarter down from the top. Negative segregation was shown in the center of the lower half, where the carbon fell to 0.40 per cent.

The metal throughout the different passes from the ingot to the finished rail, when etched with iodine, was characterized by those markings which have been familiarly shown from time to time in steel rail discussions.

It was a very rare occurrence in any pass or in any part of the ingot when markings fairly well pronounced were not brought out when etched with iodine. Dark dots or irregular patches brought out by the iodine on the cross section slices were dark streaks on the longitudinal sections. Primarily these markings show a difference in the solubility or oxidation of one part of the metal over another, this difference being due to causes not in all cases reached in the experiments recorded.

In the metal of the ingot the proximity of blow holes appeared to have been indicated. In the finished rail some of the dark zones showed differences in chemical composition, higher carbon occurring in the dark zones than in the metal of the less attacked portions. The method of treatment of the ingot was carried through the several passes down to the finished rail.

Fig. 6 shows a cross section of the second rail length from an ingot treated in the usual manner, charged hot and soaked as usual, and not laid on its side until it reached the blooming mill for rolling.

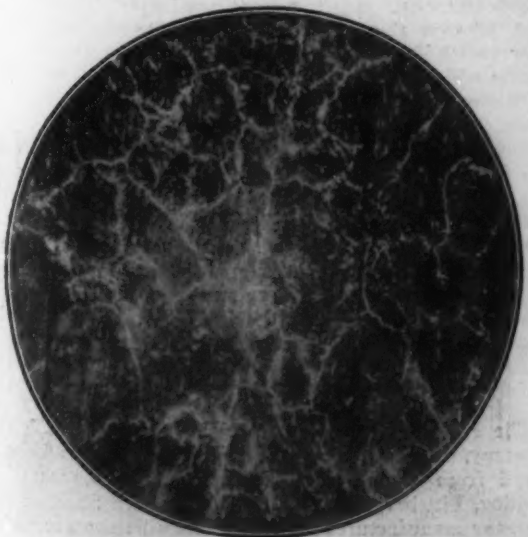


Fig. 5.—Scarf Weld Made with Ends of Fractured Tensile Test Piece. Magnification, 62.5 Diameters.

In Fig. 7 is a cross section from the sixth rail length of another ingot which was laid on its side to cool immediately after stripping and was reheated and rolled. The pronounced markings in the head of the rail seen in this cut were generally found in the other sections examined. Fig. 8 shows the cross section from the second rail length of another ingot which was laid on its side immediately after stripping, web up. All of the sections examined which came from this ingot had their characteristic mark-

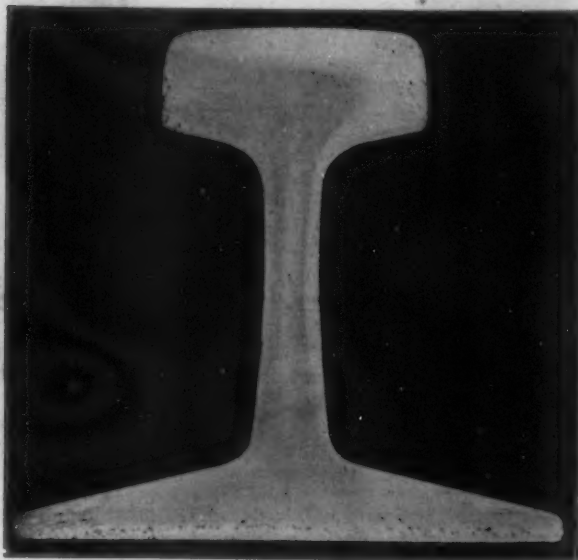


Fig. 6.—Etched Section from Second Rail Length. Ingot Treated in Regular Way, Charged Hot and Soaked as Usual.

ings the same as shown by this illustration, the darkest lines after etching with iodine being on the same side of the web.

A state of seaminess was found in shapes from ingots which were laid on their side immediately after stripping. The iodine markings in such cases were taken to indicate a lack of structural continuity in the metal. Tensile tests of the steel were made for each of the passes. In the earlier ones several specimens were taken from different

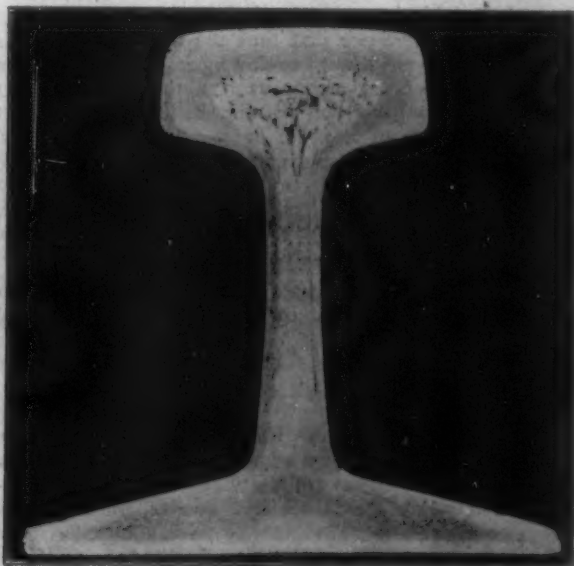


Fig. 7.—Etched Section from Sixth Rail Length. Ingot Laid on Side to Cool, Head Up, Reheated and Rolled.

parts of the cross section. It was noted that some of the inside specimens, particularly those from the bloom, were deficient in strength and incidentally in elongation and contraction of area. This behavior suggested to the investigators a plausible cause for the frequency of web fractures in rails across the bolt holes.

The markings brought by iodine etching of the Bessemer rails and earlier shapes were also brought out in the open hearth rails and shapes. Likewise the markings

appeared to some extent in the rails from the electric furnace.

It was remarked that flange fractures made during the tests correlated the end markings on the etched cross sections with the characteristic laminated metal displayed in the case of crescent breaks which attracted attention in



Fig. 8.—Etched Section from Second Rail Length. Ingot Laid on Side to Cool, Web Up, Reheated and Rolled.

engineering circles not long ago.

The report is an important contribution to the metallurgy of steel rails and reflects much credit upon James E. Howard, who conducted this work at Watertown. Later he accepted a position at the Bureau of Standards, Washington, where research tests of this character are now being continued.

The "Original" Babbitt Metal Formula

The discovery that soft metal makes an excellent bearing surface belongs to Isaac Babbitt, of Boston, Mass., who patented his invention in the United States July 17, 1839 (No. 1252). Since that time the use of soft metals as bearings has grown until to-day more is employed than ever before. It is an erroneous idea that Isaac Babbitt patented the actual white metal mixture itself. His patent was upon the use of a white or soft metal in bearings. While he did not claim any particular metal mixture, he recommended the use of the following:

Tin	50 lb.
Antimony	5 lb.
Copper	1 lb.

This mixture is somewhat softer than that now employed as "genuine Babbitt metal," as it has been found expeditious to use more copper in order to obtain a harder metal.—Brass World.

The Murray Iron Works Company, Burlington, Iowa, is completing an extensive addition to its boiler shops. This addition is 120 x 140 ft., and will have a large traveling crane covering the center and smaller cranes on the side. The building is of substantial construction, having a steel frame. The addition will enable the company to increase greatly its production of water tube, tubular and fire-box boilers. Other products of the company are Corliss engines, heavy castings and steel plate work. It is therefore able to supply complete power plants.

The Mining & Coking Equipment Company, recently incorporated under the laws of Pennsylvania, will have its main offices in Pittsburgh, Pa. Besides manufacturing and selling the Beutlich coke oven door and other equipment, the company will design special requirements of the mining and coking industry. A. F. Ehrenhaft is president and Richard F. Beutlich is secretary and treasurer.

Belgian Supplies of Iron Ore

The London *Iron and Coal Trades Review* discusses in the following the falling off in shipments of German iron ore to Belgium:

The iron and steel industry of Belgium is entirely founded upon the inland coal resources, as the native supplies of iron ore are insignificant, and the ore requirements of the blast furnaces are principally met by the French department of the Meurthe and Moselle and by Luxemburg and Lorraine, which form part of the German Customs Union. In 1910 the Belgian imports of iron ore amounted to 5,182,400 tons, of which 2,910,000 tons, or 56.15 per cent., were furnished by the French Minette basin and 1,827,300 tons, or 35.25 per cent., by the German Customs Union, the two districts having consequently supplied 91.40 per cent. of the Belgian imports. The balance of the imports was obtained to the amount of 140,800 tons from Spain, and 304,300 tons from Sweden and other countries. The great preponderance of French ore supplies over the German Customs Union in Belgium is all the more surprising as Germany had an indisputable supremacy in the Belgian iron ore market as late as 1907, with 2,209,000 tons, or 61 per cent. of the total Belgian imports. This position was maintained with 2,130,000 tons, or 54.8 per cent. in 1908, but it declined to 1,787,400 tons, or 40.08 per cent. in 1909, and only reached slightly over 35 per cent. in 1910. On the other hand the exports of France to Belgium have increased on a very considerable scale since 1901, when they only amounted to 69,313 tons. In 1905 the quantity of ore had risen to 644,676 tons, in 1909 to 2,261,493 tons and in 1910 to 2,910,000 tons the greater portion being exported from the Briey district.

The falling off of German supplies of iron ore to Belgium was bound to take place in a great measure as soon as the rich ore in the newly opened Briey district entered into serious competition with Luxemburg and Lorraine ore, which has an iron content of only 30 to 32 per cent. as compared with 38 to 40 per cent. in the case of the French ore. Not only so, but it is asserted that the Briey producers are able to forward their output by means of the French Eastern Railway Company and the Belgian State Railways at extremely low rates to the destination desired. If the proposed North East canal should be carried out within a reasonable period and thus place the Briey basin in direct communication with the French and Belgian system of waterways, it is calculated that iron ore from Luxemburg and Lorraine would be still further supplanted, if not wholly excluded.

"At one time Belgian iron and steel masters sought investment in the iron ore fields of Luxemburg and Lorraine, and secured possession of a number of fields. When the French Government granted concessions in the Briey district in 1902 the applicants included a number of Belgian manufacturers who had undertaken boring operations in the locality, and the latter received various concessions. A similar policy was pursued by the Belgian Government in the allocation of the newly discovered coalfields in the Campine, inasmuch as a fairly large share was granted to French interests. It is therefore considered that from this point of view there is little hope of Luxemburg or any other part of the German Customs Union recovering the position which has been lost in the Belgian iron ore market.

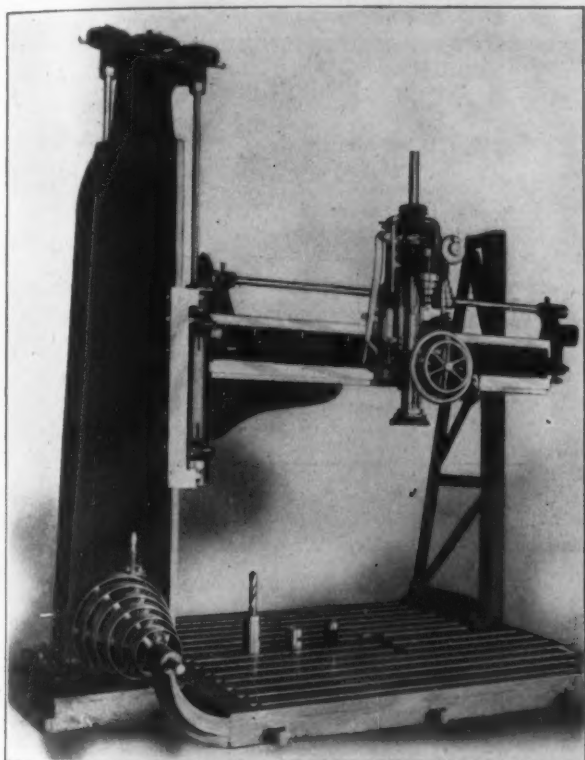
Luxemburg and Lorraine, however, have gained compensation in pig-iron for what they have lost in iron ore in the Belgian market. Thus in 1908 the exports of pig-iron from Luxemburg to Belgium only amounted to 33,100 tons, but in 1909 they rose to 119,900 tons, and a further advance to 163,900 tons took place in 1910, being an increase of about 400 per cent. since 1908. In the case of Germany the exports to Belgium were 117,400 tons in 1908, 141,500 tons in 1909 and 308,300 tons in 1910. On the other hand the French exports to Belgium, which amounted to 131,200 tons in 1908, declined to 87,900 tons in 1910."

The Pittsburgh office of the Youngstown Sheet & Tube Company, E. S. Rooney, resident manager, has been removed from the Farmers' Bank Building to 1433 Oliver Building, Pittsburgh, Pa. The Youngstown Sheet & Tube Company manufactures pig iron, steel billets, sheet and tin bars, iron and steel pipe, pure puddled iron and steel sheets, wire rods, wire and wire nails.

The Kane & Roach Radial Drill

Kane & Roach, Niagara and Shonnard streets, Syracuse, N. Y., have recently placed on the market a new radial drill which is designed to cover a wide range of work. Extra heavy work, and especially pump castings, can be accommodated, and the machine is claimed to be one of the largest built in this country. The drive is of the all-gear type, and the radius of the arm is 9 ft. Another special feature of the drill is the ability to use any desired style of attachment.

The radial arm is of semi-box construction with reinforcing ribs spaced about 1 ft. apart. The bearings upon which it swings have a ball-bearing, and the arm is raised



A 9-ft. Radial Drill Built by Kane & Roach, Syracuse, N. Y.

and lowered by power through a set of gears which actuate the elevating screw in the interior of the column. A special attachment is furnished for use when heavy boring is being done or large castings are being milled off.

The head can be fed in and out on the radial arm by power by the feed screw when large castings are being milled, or by hand when the rack at the lower portion is used. The spindle is 4 9/16 in. in diameter and has a 20-in. travel. A large number of speeds can be secured, and powerful back gears are also furnished. The control of the machine and the speed variation is secured by manipulating the two levers at the left of the head. The spindle runs in a bronze bushing of ample proportion, which can be replaced easily. Four feed changes are available, and the spindle is counterbalanced with a coil spring that keeps it at any point within the full range of its travel without employing a counterweight. In the engraving the machine is illustrated with a large milling cutter screwed on the spindle. If desired, any style or size of milling cutter can be fastened on the spindle, or a threaded chuck can be attached and a boring bar screwed in when heavy boring has to be done. A chuck for holding taper shank drills, or a large head or face plate having a gear, can also be substituted. An extra journal and gear are provided with this face plate, so that it is driven from the back gear in the same way as a triple-gear lathe for very large boring, facing or milling operations. Some of the different attachments which can be used with this drill are shown on the base.

In the drive, gears are employed exclusively. The power can be transmitted to the six-step cone pulley on the side of the column by a belt, or it can be driven from the back, whichever arrangement gives the straight belt

drive. The column has an overall height of 14 ft., and the height from the base to the top of the slide is 10 ft. 6 in. Work 8 ft. high can be accommodated under the spindle. The dimensions of the base are 10 by 14 ft., and the machine weighs approximately 13 tons.

A Buffalo Forge Fan 30 Feet High

One of the largest fans ever made is the subject of the accompanying illustration. It is over 32 ft. high and was made by the Buffalo Forge Company. It is used in connection with a heating, ventilating and air conditioning system, supplying 25,000 cu. ft. of air per hour to the new mill of the Sharp Mfg. Company, New Bedford, Mass., which is understood to be the largest individual yarn mill in that city. The air is washed before entering the mill, dust, dirt and foreign matter being removed. In winter the air is heated with independent regulation on each floor. Provision is also made for cooling the air, so that in the hottest days of summer the temperature throughout the mill, even in the spinning room where the machinery generates an immense amount of heat, may be from 15 to 20 deg. cooler than is possible by ordinary window ventilation.



The Central Foundry Company Reorganized

The reorganization of the Central Foundry Company, which failed in February, 1910, has been completed by the election of directors and officers. The new company, a Maine corporation, has a total capitalization of \$9,200,000, of which \$3,600,000 is common and \$4,600,000 is preferred stock. An issue of \$1,000,000 6 per cent. first mortgage bonds has supplied \$1,000,000 working capital. The new preferred stock may not receive more than 4 per cent. in dividends in 1911 and 1912, and thereafter no more than 5 per cent. until a like amount may be paid on the common.

Waddell Catchings, who carried the company through its receivership, was elected president; De Courcay Cleveland, secretary and treasurer, and W. H. Feltt, assistant secretary and treasurer. The new directors are J. N. Wallace, C. D. Smithers, August Hecksher, G. D. Halleck, N. D. Bill, P. J. Goodhart and G. H. Kinnicutt. Three other temporary directors are to be replaced later by practical iron men.

More than one-third of a billion passengers carried in eighteen years and a half, and not one killed as the result of a train accident, is the record of the Long Island Railroad. The official figures, just announced, show that this subsidiary of the Pennsylvania Railroad has carried exactly 335,148,826 passengers since June 1, 1893. The Long Island Railroad has probably the densest passenger traffic in the country, and, due to the restricted territory covered, all of this traffic is properly termed suburban. It is thus seen that commuting on the Long Island has been made as safe as modern science and engineering can make it. The density of the traffic is shown by the fact that the number of passengers carried one mile since 1893 is 4,904,736,994, or more than one-third of the population of the entire world.

Accident Prevention in the Machine Shop

How a Machine Tool Factory Safeguards Its Own Employees as Well as Those Who Operate the Lathes of Its Manufacture

BY HENRY M. WOOD, CINCINNATI, OHIO

Accidents to workmen in our various industries can never be entirely eliminated. They can, however, be very much lessened by reasonable precautions in the way of education of the workmen, inspection of buildings, efficient lighting and guards on dangerous moving parts of machinery. This last item, the providing of gear guards and other safety devices for the protection of machine operators offers probably the greatest field for accident prevention in the majority of factories.

Labor laws of the various States have for a number of years embodied different accident clauses, but the provisions for enforcing such laws were usually inadequate. Recently several State legislatures have passed comprehensive bills requiring that all gearing and other dangerous moving parts of machinery be covered, and the factory inspector is becoming more watchful.

To the credit of the managements of many firms let it be said that they did not wait for legal compulsion to take proper precautions for the protection of workmen. Many firms outside of those States in which stringent laws have recently been passed are taking up the matter. And many corporations are making much more of a study of the question than any law could compel.

The United States Steel Corporation has recently organized a Committee of Safety consisting of executives from its different plants, which publishes from time to time a Safety Bulletin describing new devices for safeguarding machinery and reducing accidents in its steel mills. The American Steel & Wire Company, with large mills in several sections of the country, has recently inserted a clause in its form inquiries for machinery to the effect that preference will be given to machines equipped with complete gear guards and safety devices.

The Machinery Manufacturer's View-Point

The machinery manufacturer is, or should be, interested

in two phases of safeguarding machinery: 1. "How can I best equip my own factory for the safety of my own workmen?" 2. "What safety devices can I incorporate in the machines I manufacture, so as to reduce the accidents attending their operation and to increase their salability?"

The accompanying illustrations show how the Lodge &

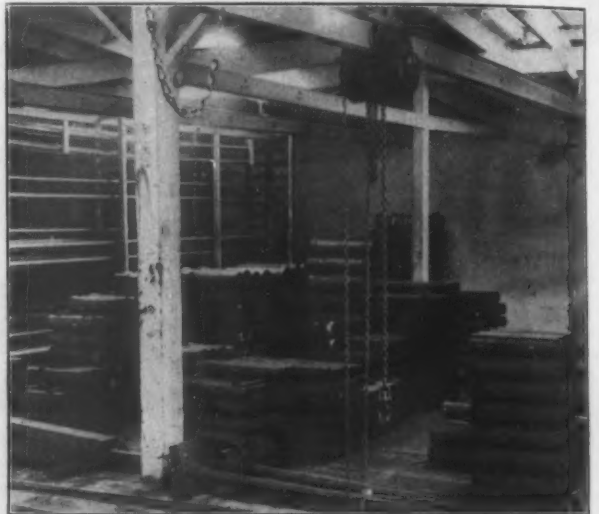


Fig. 1.—Safety Stacking of Heavy Round Bar Stock.

Shipley Machine Tool Company, Cincinnati, Ohio, has answered both of these questions. Most of the principles described are applicable to any type of factory in the metal trades, and, with some modifications, to the majority of plants using power-driven machinery.



Fig. 2.—Metal Racks of Pipe and Fittings for Storing the Lighter Bar Stock, Lodge & Shipley Works, Cincinnati.

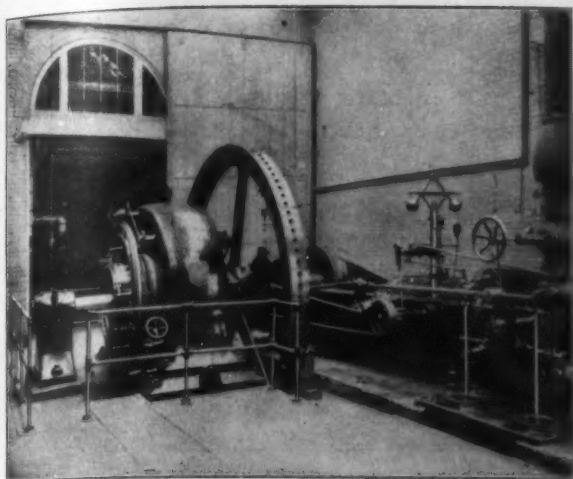


Fig. 3.—Metal Railing Around Moving Parts.

Safety Storage in Stock Room

Beginning with the receipt of the raw material, there are safe and unsafe methods of storing it until ready for use. Fig. 1 is a view in the stockroom to show a method of safety stacking for heavy round-bar stock. Retaining pieces made of small bar-iron are bent up on each end like a sled runner; two of these strips are placed on top of each layer of bar stock. The upturned ends prevent the bars in the next layer above from rolling out. This not only prevents the mashed foot which is an occasional result of the usual triangular stack of bar stock tumbling down, but also allows more stock to be stored in the same space because the section of the pile is square instead of triangular.

The lighter stock is stored in specially constructed metal racks illustrated in Fig. 2. The racks in the foreground which hold the round bar stock have a framework built up of pipe and fittings. Cast-iron clamps are attached wherever desired and crossbars on which the stock is laid are placed across the clamps. Miscellaneous parts are kept on the racks in the background, which are built up of angle irons. Such racks allow easy access to all material, and permit stock to be removed without danger of other pieces falling.

Guard Rails in the Power Plant

A double metal railing about three feet high should surround the rotating and reciprocating parts of the engine

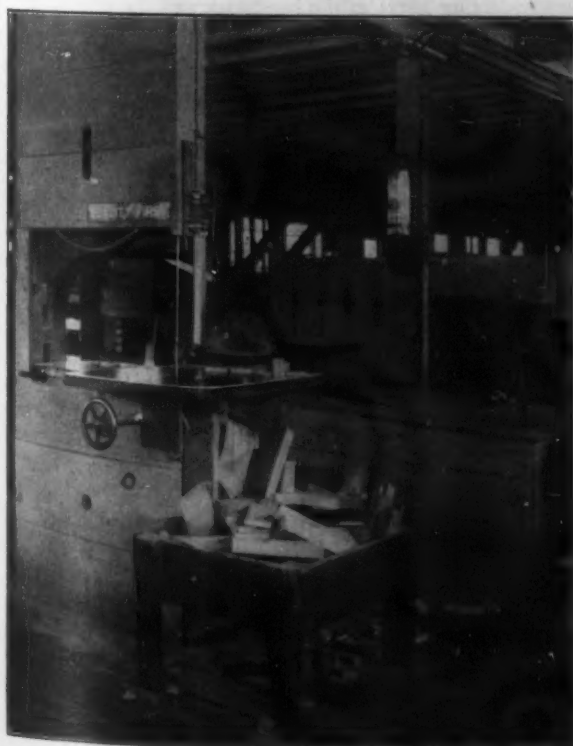


Fig. 4.—Boarded Up Band Wheel.

room equipment. Such a railing is shown in Fig. 3 around the generator and fly-wheel. A similar railing is placed in front of the cross-head and connecting rod of the engine, but, of course, does not show in this particular view. The same sort of railing would be used around the pulley and driving belt if the engine were belted direct to the line shaft. In no case should the railing be closer than a foot to any moving part of the engine.

If the prime mover is a gas engine it can be guarded with a similar railing, which in this case would include the starting crank used on the small sizes of gas engine. Steam turbines, from the nature of their construction, are totally enclosed, and in this respect present quite a contrast to the ordinary reciprocating engine.

The belt or rope used to drive from engine to factory, where electrical transmission is not used, should be surrounded by adequate railing or casing so that it is impossible for a workman in passing to come accidentally in contact with the belt.

Transmission Machinery Guards

All belts near the floor should be fully protected; for



Fig. 5.—Safety Wood Planer; Sanding Wheel in Background.

example, if power is transmitted by belt from a motor on the floor to the line shaft, the vertical belt should be fully surrounded by railing, or better yet, covered by screen to a height of about seven feet. Shafting and pulleys should always be guarded if near the floor, and in many cases should have a protecting guard if on the ceiling, where a workman has to go frequently.

A belt-driven sand-papering wheel seen in the background in Figs. 4 and 5 illustrates one way of enclosing transmission machinery when on or near the floor. There is no overhead shafting in that department, so that the countershaft for driving the sanding wheel has to be placed on the floor and driven through a hole in the floor from the ceiling line-shaft of the room below. The countershaft and most of the belt are enclosed in a tight box, with a slot in the top, through which projects a shifter lever for starting and stopping the machine.

A simple guard for shafts and pulleys—consists of a sleeve or pipe fitted over the shaft with a disk attached to the end of the sleeve next the pulley so as to entirely cover up pulley arms. The sleeve, of course, is stationary, and therefore has to be mounted in brackets so that it may remain concentric with the shaft, but not touching it.

Shafting couplings used for connecting adjoining sections of line shaft should have bolts and nuts countersunk. Set screws used in hubs of pulleys and similar locations, if of the usual cap-screw type, should be countersunk into the hub. There is also on the market a safety set-screw which is headless and operated by a hollow key from the inside, thus entirely preventing any projecting corners.

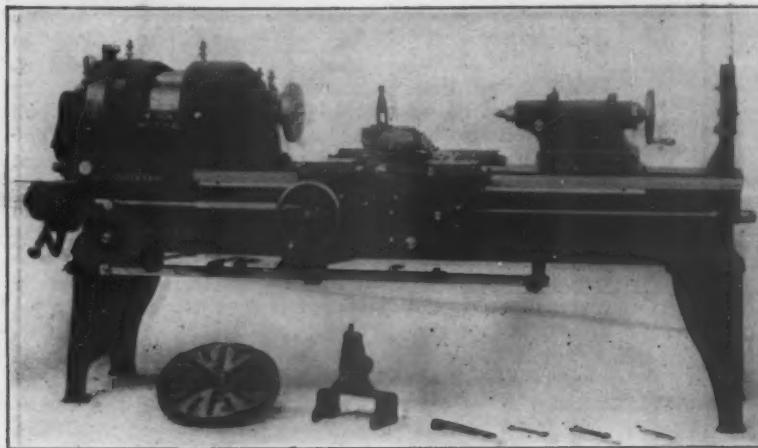


Fig. 7.—Cast Iron Cover Completely Inclosing Headstock Gearing.

Gear Covers for 19-in. Patent Head Lathes Made by Lodge & Shipley Machine Tool Company.

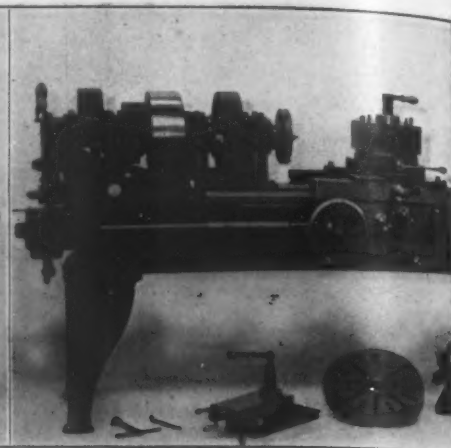


Fig. 6.—Partially Guarded Gears.

Safeguards in the Pattern Shop

A band-saw as regularly furnished is dangerous because of the possibility of a workman's carelessly pushing the end of a board into the revolving band wheel at top or bottom, to say nothing of the continuous risk from breakage of the saw. Fig. 4 shows a band-saw fully protected by tightly boarding up the band wheels at the top and bottom. The only exposed portion of the saw is that directly in front of the operator, the part which actually does the cutting.

A safety cylinder wood planer is illustrated in Fig. 5. In this machine the revolving cylinder carrying the planing knives is cut away for a small distance only, directly in front of each of the knives. This makes it impossible for the operator to accidentally lose a finger between the knife and the table. The old-style planer as known to most patternmakers is dangerous because of the great clearance between the knife and cylinder.

The Danger with Grinding Stands

The tool grinders located in different departments of the machine shop are usually placed in an open space on the

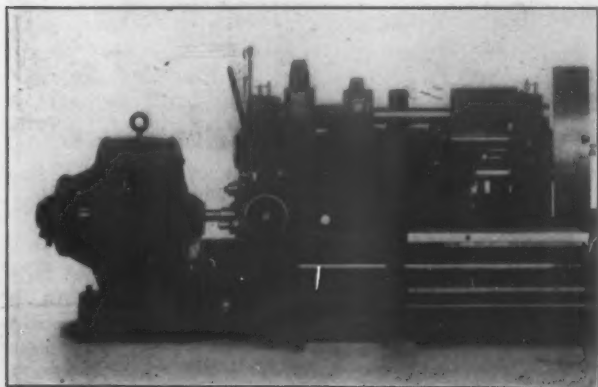


Fig. 8.—Partial Gear Guards for 36-in. Headstock.

floor, and in such cases the driving belt and the grinding wheel should be guarded by screen or hood. Several grinding stands on the market have heavy iron hoods covering the greater portion of the grinding wheel, thus protecting the workman against contact with the revolving wheel and guarding against accident as a result of bursting of the wheel.

To further guard against the danger of bursting, some grinding wheels are made thicker at the hub than at the rim, that is, the side of the wheel is convex and fitted with concave collars. The collars, being screwed up tightly against either side of the wheel would, in case the wheel should burst, hold the center portion of the wheel to the spindle.

Safety Provisions for Metal Planers

The usual medium-sized, spur-gear planer has driving belts on one side and reducing gearing on the other. Both the driving belts and the gears should be fully covered. A tight box made of matched boards slotted for the belts to pass through answers very nicely for the driving side of the planer. The gears can be totally covered by boards or screen.

In the spiral-gear type of planer the driving belts and exposed portion of the gearing are on the same side of the machine. If a metal gear guard is furnished with the planer a light protecting railing around the belt will be sufficient. If, on the other hand, the planer is not fitted with an

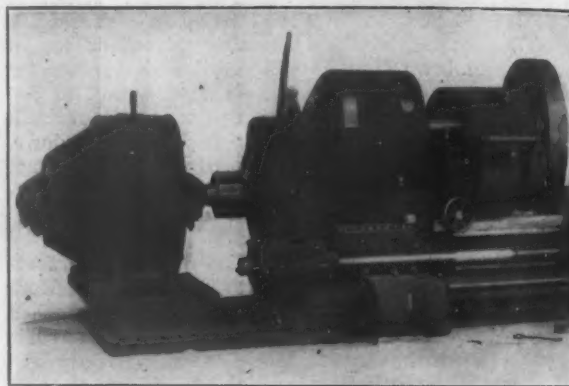


Fig. 9.—Complete Gear Guards for 36-in. Headstock.

adequate gear guard it is well to build a box around both the driving pulleys and the gears.

Engine Lathes

The only dangerous gearing on an engine lathe consists of the driving gears in the headstock and the change gears or reversing gears carried on the end of the headstock. The accompanying illustrations show recent Lodge & Shipley designs for totally covering all of these gears in contrast with the partial gear guards formerly used.

Figs. 6 and 7 illustrate 19-in. belt-driven Patent Head engine lathes with double back gears as regularly manufactured in the smaller sizes. Fig. 6 shows the machine as formerly built with partially guarded gears. Fig. 7 shows the present construction of the same size of

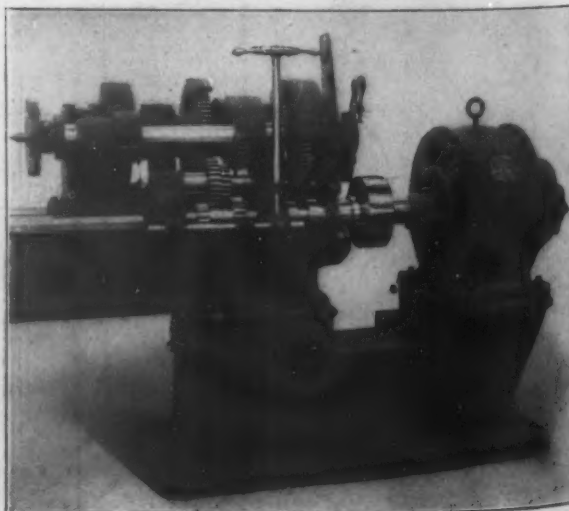


Fig. 10.—Former Partial Guarding of Small Lathe Headstock.

lathe in which a large cast-iron cover, with just enough opening in the center for the driving pulley, completely incloses all of the headstock gearing.

Large lathes require an entirely different style of gear guard, because they are triple-gearred and carry the triple-gearing as well as the back-gearing at the front of the headstock.

In the remainder of the illustrations of different styles of lathe guards we show the headstock end of the machines only, because, as previously mentioned, that is the only part of an engine lathe where safety devices are necessary to the protection of the operator.

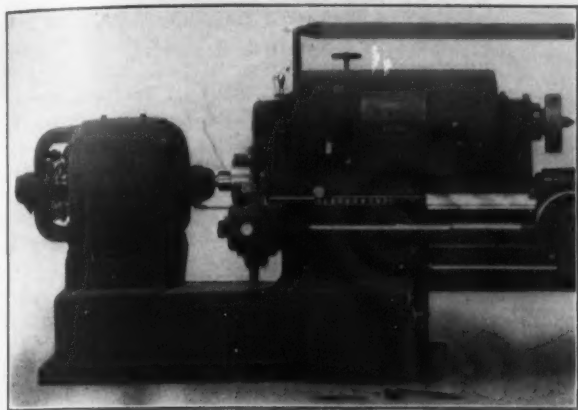


Fig. 11.—Fully Inclosed Gears of 24-in. Headstock.

Figs. 8 and 9 illustrate 36-in. motor-driven, triple-gearred headstocks "before and after" the application of complete gear covers. The latter view is made at an angle to show not only the covers over the back gears and triple gears, but also the guard over the reverse-plate gears on the end of the headstock and the guard over the internal gear of the face plate.

The last group of cuts shows front and rear views of back-gearred, motor-driven headstocks, with and without complete gear covers. Formerly the small sizes of motor-driven lathes were built with headstocks as shown in Fig. 10, in which the gears were partially guarded, but not completely inclosed. The present Lodge & Shipley design for such machines is illustrated in Figs. 11 and 12. As shown by these cuts, it will be seen that guards are now placed over every gear, so that there is not a single exposed tooth on any one of the gears of the lathe.

Results

The main object in enclosing gears and other moving parts of machinery is, of course, the protection of the workman. That this can be easily and thoroughly accomplished in the case of the majority of machine shop tools has just been shown.

At the same time, the former convenience of operation of the several machines has in no way been impaired. The gear guards on the lathes illustrated can quickly be re-

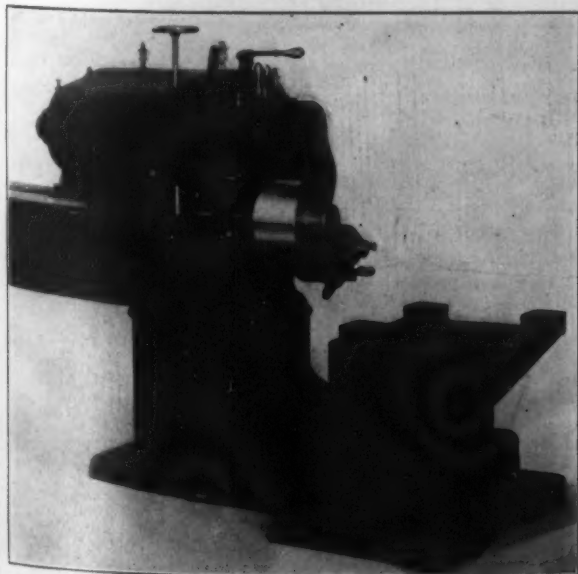


Fig. 12.—Fully Inclosed Gears of 20-in. Headstock.

moved for inspection of the gears and shafts when necessary. Provision is made for oiling from the outside so that it is seldom necessary to remove any of the gear covers. There is therefore no temptation to the workman to throw the gear guard to one side as being too cumbersome.

A secondary feature of the totally inclosed gearing, but, nevertheless, one of considerable importance, is that chips and other foreign matter are kept entirely out of all the gearing. This prevents noise and greatly increases the life of the machine.

The Dick Belt Factory at Passaic, N. J.

The firm of R. & J. Dick, Ltd., was founded in 1847 by the late Robert and James Dick, their business then being guttapercha specialties. Robert Dick was an inventive genius. He experimented for many years on a canvas driving belt, using as a foundation the materials guttapercha and balata with which he was very familiar. He experimented on this belt for about 20 years before producing the present Dickbelt, which was, of course, protected by patents and is the original balata belt. A large factory for the manufacture of this belting was erected by the firm in Glasgow, Scotland, about 30 years ago and is now its main works. The sales increased so much that the factory has had to be enlarged on several occasions.

By reason of the high tariff in this country, and also as the firm's business in other countries of the world was so large, keeping its main works fully worked, it had done practically no business in the United States up to two years ago. It was then decided to erect a factory here. The building at Passaic, N. J., was completed last year. All the machinery, which is secret, was imported from Scotland, except the engines, boilers, pumps, such appliances as could easily be obtained in this country. A certain number of the men, together with the superintendent of the Glasgow Works, who have been making this belt all along, came over and spent several months educating American workmen in the manufacture of the Dick belt, and the firm is now producing exactly the same belt here as it has produced for so long a time at its other works.

The Passaic plant is a very large one, capable of turning out as much belting as the main works in Glasgow, Scotland. It can supply any width of belt up to and including 72 in. within 48 hours of the receipt of the order.

R. & J. Dick, Ltd., are working their business mainly through jobbers, but have opened branch stores at 50 Church street, New York City; 289 Market street, Newark, N. J.; 147 North Seventh street, Philadelphia, Pa.; 29 West Lake street, Chicago, Ill., and 912 Candler Building, Atlanta, Ga.

The Production of Coal in 1910

The unofficial estimate of the coal production of the United States for 1910, by E. W. Parker, coal statistician of the United States Geological Survey, is between 480 and 490 million tons. As shown by the Survey's chart of coal production, just issued, the first recorded production of coal was 22 tons in 1814. By 1850 the production had grown to what was then considered the enormous amount of 7,018,181 tons, but by 1860 this figure had doubled and the production for that year was 14,610,042 tons. This was less than the production of Alabama alone for 1909. The centennial year of 1876 saw a production of 53,280,000 tons. In 1880 the figure had reached 71,481,570 tons, yet this is less than the production of the single State of Pennsylvania in 1909. By 1890 the production had jumped to 157,770,000 tons and by 1900 it was 269,684,027 tons. Surely this was about as high as it was believed by most people that coal production would go, yet the figures for 1907 showed the enormous total of 480,363,424 tons, those for 1909 were 460,803,416 tons, and according to Mr. Parker's estimate the production for 1910 may come very near the half-billion mark.

Henry Hornbostel, architect, Pittsburgh, has completed plans for new buildings to be added to the Margaret Morrison School and the School of Applied Design of the Carnegie Technical Schools at Pittsburgh, for which Andrew Carnegie recently donated \$1,500,000. It is expected that bids for the erection of these buildings will be asked for during this week.

Practical Side of Electric Spot Welding

Possibilities and Limitations of the Method of Riveting Without Punching Holes or Using Rivets

Spot welding, as indicated by the name, is a method of joining metal sheets together at any desired point, by a

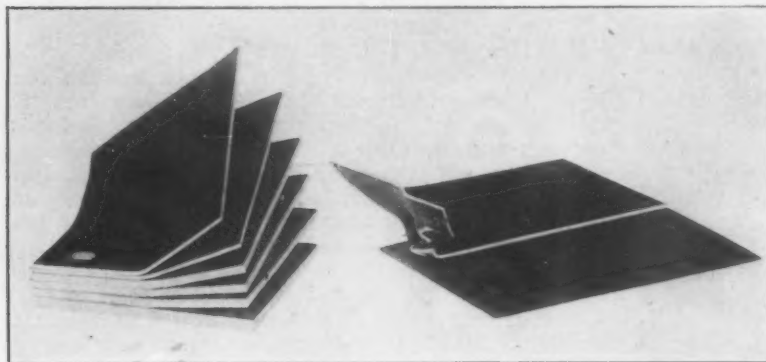


Fig. 1.—Six Sheets Electrically Welded; Proof of Fusing.

spot the size of a rivet, without punching holes or using rivets. It is done electrically by fusing or melting the metal at the point desired, and at the same instant applying sufficient pressure to force the particles of molten metal together.

In spot welding, a large volume of current at such low voltage or pressure that it cannot be felt by the bare hand passes through a pair of copper die points; two pieces or more of sheet steel are placed between these points, and when the current is turned on with the switch the pieces of steel offer so much resistance to the flow of current that they instantly become hot at the point opposite the copper dies. The hotter the steel becomes, the greater is the resistance, and automatically the current is forced into the adjacent cooler parts until all the metal in proximity to the dies is brought up to the welding temperature, when a slight pressure on the lever handle mounted on the machine forces the molecules of molten metal together and they are united. This is done in an incredibly short space of time, taking only a fraction of a second when stock as light as 20 gauge is welded. In actual practice one of the copper dies only is pointed and the opposing one is flat. The pointed die leaves a slight indentation on one side of the metal and the opposite side is perfectly smooth.

Fig. 1 shows six pieces of sheet steel of varying thick-

nesses welded together at one time; also two pieces torn apart—near the weld—indicating that the metal has been absolutely fused together and is not pulled apart at the weld.

Fig. 2 shows a front and back view of a spot welded piece. A photographed sectional view of a spot welded and a riveted piece of metal are also shown, which illustrates why a riveted piece is regarded as not standing within 60 per cent as much of a strain as a welded piece. The spot welded piece is fused together at the point where the slight depression is shown, making a union of the particles of steel at that point. A piece of galvanized iron is also shown which has been hammered until the metal was torn out in attempting to break the weld apart.

Fig. 3 shows a foot operated spot welder. When the foot lever is pressed down, the dies are brought together to clamp the stock, and a slight pressure with the heel on the outside pedal turns on the current to complete the operation. Where it is necessary to have the use of both hands in placing the stock in the machine, this type of welder possesses many advantages over the hand operated machine.

Fig. 4 illustrates a machine especially adapted for stove and sheet metal work. With the extended horn, almost any part of a range, it has been found, can be welded without any difficulty.

The accompanying photographic reproduction of a diagram shows the stove welder with the different parts of the machine marked. The special transformer in the welder is used to reduce the 220 or 440 volts to the 3 to 5 volts used in making the welds.

The specimens of hoop steel shown in Fig. 6 were sub-

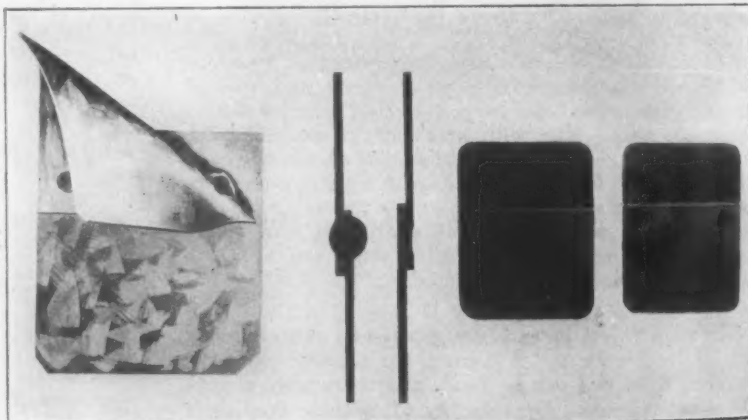


Fig. 2.—Front and Back of Spot Weld; Welding of Galvanized Sheets.

jected to a test at the Lunkenheimer Laboratory in Cincinnati. It will be noted on

Test No. 1—One spot weld broke	at 1625 lb.
Test No. 7—One rivet broke	at 990 lb.
Test No. 9—Two spot welds broke	at 2275 lb.



Fig. 3.—Foot Operated Spot Welder.

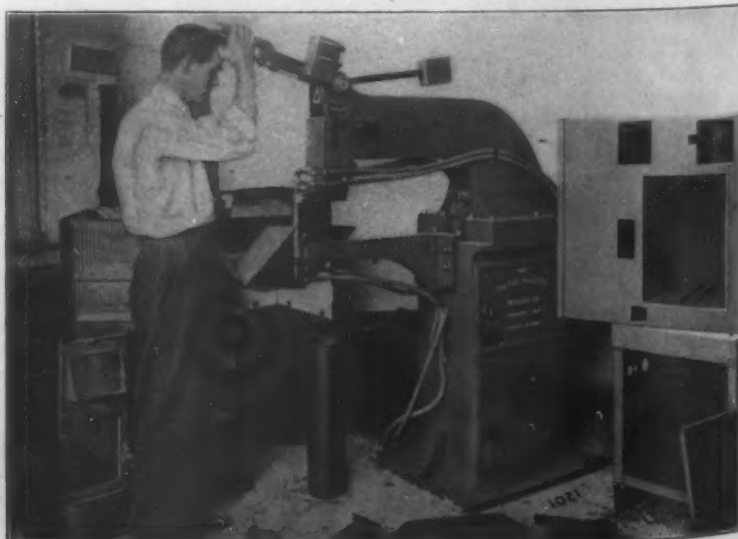


Fig. 4.—Welding Machine for Stove and Sheet Metal Work.

Test No. 2—Two rivets broke at 1555 lb.
 Test No. 3—Three spot welds broke outside of the weld at 2715 lb.
 Test No. 4—Three rivets tore apart at 2055 lb.

Single-phase alternating current must be used in electric welding. Where two or three-phase current is available, one phase only of the multiphase system is used. Any voltage from 110 to 500 can be used, but 220 or 440 is preferred as being more nearly standard than any other, and all stock machines for quick delivery are arranged for 220 volts. Any frequency from 25 cycles to 140 cycles can be used, but owing to the large transformer required in the welder when less than 60 cycles are used an additional price is charged for welders operating on 25 to 40 cycles.

The power factor varies from 70 to 85 per cent. according to the work and the way it is handled. Inside the welder and part of it, is a special transformer to reduce this outside current to the 3 to 5 volts used in making welds. This is so low that it cannot be felt by the bare hand and explains why the confidence of the operator is secured.

Based on current costing 1 cent per kilowatt hour, it will cost from 1 cent to 3½ cents per 1,000 welds. One may multiply the price given in the accompanying table by the rate charged by the lighting company to give the actual cost per 1,000 welds.

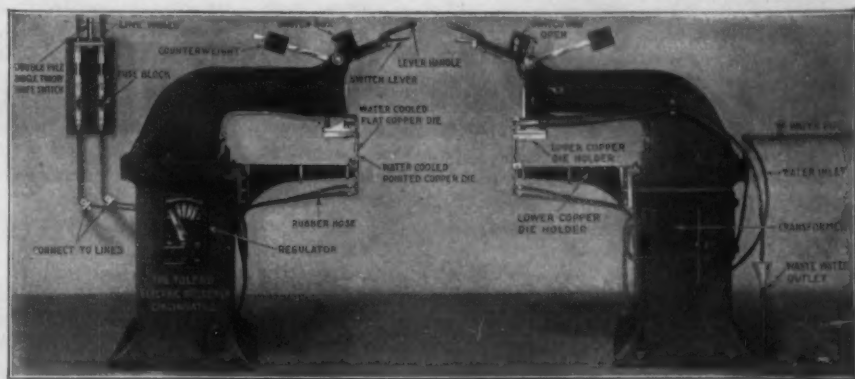


Fig. 5.—Diagram Showing Different Parts of Toledo Electric Welder.

COST OF WELDING DIFFERENT GAUGE SHEETS.

Gauge of Sheet Steel.	Thickness in Fractions of an Inch.	Approx. K.W. Capacity.	H. P. at Dynamo.	Time in Seconds to Weld.	Cost Per 1,000 Welds at 1c. per K. W. Hr.
10	9-64	18	25	1.5	3¼¢
12	7-64	16	23	1.3	3
14	5-64	14	20	1.0	2¼
16	1-16	12	18	.9	2½
18	1-20	10	15	.8	2¼
20	3-80	9	14	.7	2
22	1-32	8	13	.6	1¾
24	1-40	7	11	.5	1½
26	3-160	6	9	.4	1¼
28	1-64	5	8	.3	1

No preparation of stock is required unless it is very rusty or scaly, in which case it will be found economical to clean off the rust or scale to minimize current requirements.

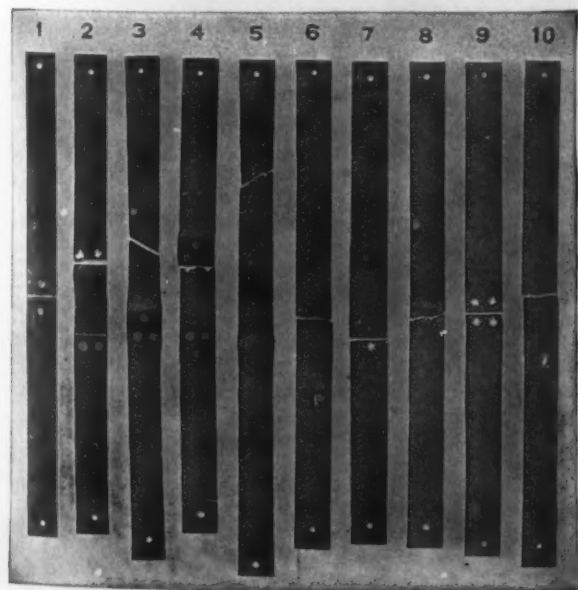


Fig. 6.—Convincing Tests of Electric Welding.

Ten specimens of hoop steel subjected to test showing tensile strength. All pieces the same size, 1.12" x .035".

- No. 1. Spot welded in one place—broke at weld at 1,625 lb.
- No. 2. Spot welded in two places, also two rivets—broke at rivets at 1,555 lb.
- No. 3. Spot welded in three places—broke outside weld at 2,715 lb. (Notice elongation of metal.)
- No. 4. Spot welded in three places, also three rivets—broke at rivets at 2,055 lb.
- No. 5. Solid lap weld—broke outside weld at 2,720 lb.
- No. 6. Butt welded—broke at weld at 2,555 lb.
- No. 7. Spot welded in one place and riveted once—broke at rivet at 990 lb.
- No. 8. Solid lap weld—broke at weld at 2,425 lb.
- No. 9. Spot welded in two places—broke at weld at 2,275 lbs.
- No. 10. Plain piece of hoop iron, not welded—pulled apart at 2,690 lb.

There is a limit to the thickness of sheet metal that it is practical to spot weld. This is due to two causes: 1—The fact that the copper rods which conduct the electric current can only carry a certain quantity of current without excessive heating. When sufficient current is carried over these copper rods or die points to bring very heavy metal between them up to the welding temperature, the copper rods, it is found, will become so hot they will soften and the points wear away so rapidly that it is not practical to use them for this kind of work. 2—It is necessary to have the two pieces of metal touch each other at the point where the weld is made. With very heavy stock, a slight kink

or bucking of the metal will prevent the flat surfaces from making good contact. Stock as heavy as 3/16 or ¼ in. can be welded, but the best results, it is stated, are obtained when ⅛ in. or lighter stock is welded. Copper and brass cannot be spot welded for the reason that they are both good conductors of electricity and offer no resistance to the flow of the current. It is impracticable to weld cast iron as there is no fibre to stock of this kind and the metal will tear out at the welded spots.

Galvanized iron can be welded although it will burn off the zinc, leaving the iron exposed at the point where the copper dies come in contact with the metal. Heat has no effect on the electric weld and for this reason this process is largely used by stove manufacturers in making sheet steel ranges and similar work. It is not found practical to make more than one spot weld at a time, as it is almost impossible to make a number of die points bear on the stock with equal pressure, and the one die point making the best contact, will carry all of the current, and the result will be that so much current is concentrated at this point that the metal is likely to be burned.

The foregoing information was obtained from the Toledo Electric Welder Company, Cincinnati, Ohio. The machines used for this work can be furnished either hand operated, foot operated, or power driven. A depth of throat can be furnished from 6 to 48 in., and a variety of types are made to suit almost any kind of sheet metal work where rivets are used.

The Government Asks for a Substitute for Turpentine.—The Bureau of Supplies and Accounts of the Navy Department is being severely criticized by paint and oil manufacturers and dealers for having advertised for bids on 10,500 gal. of "turpentine substitute." It is contended that the government, which is putting forth so much effort to do away with adulterated foods, drugs, etc., should not encourage the manufacture and sale of substitutes for such a common and useful article as turpentine; and, furthermore, that if substitutes are desired they should be designated by some other name than the one used in the Navy Department schedule. It is also pointed out that the federal authorities in the present instance are seeking to have manufacturers turn out goods which are prohibited by the laws of Georgia and Florida.

The New Richmond Forgings Plant

The Richmond Forgings Corporation, Richmond, Va., was incorporated September 20, 1905, and began work March 15, 1906. The equipment consisted of one 2000-lb., one 1250-lb. and one 400-lb. steam hammers and one 2-in. upsetting machine, with a power plant designed to cover about 100 per cent. increase in equipment. The business developed rapidly, and within six months a 1500-lb. steam hammer was added. The plant was located on the historic Belle Isle in the James River and within the corporate limits of the city of Richmond. This location was selected to take advantage of the abundant water power as well as its very low cost, while the transportation facilities were good as the Southern Railway tracks ran into the yards.

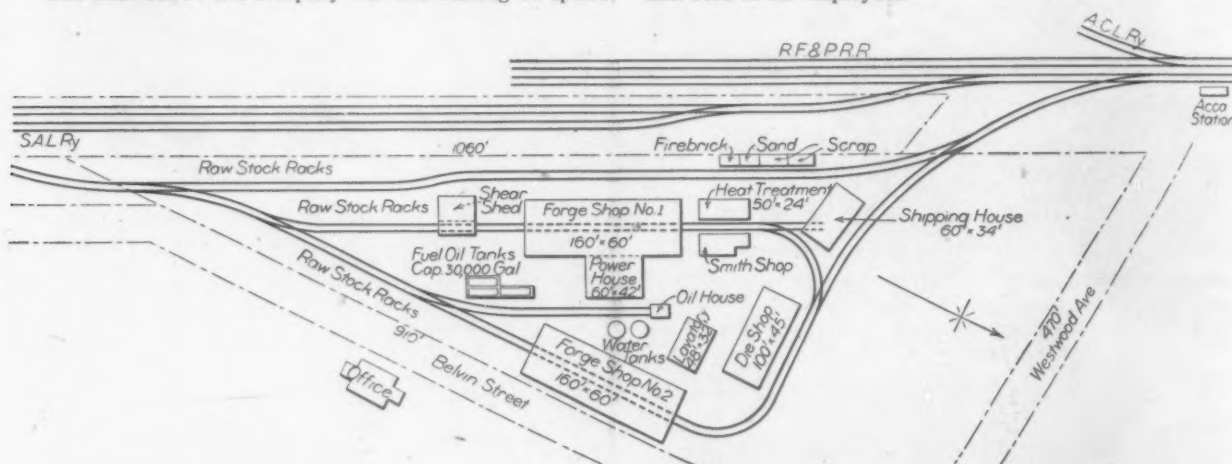
The incorporators and principal stockholders were Joseph Bryan, director of the Southern Railway Company and the American Locomotive Company; Jonathan Bryan, director of the Birmingham Land Company and the Bank of Commerce and Trusts; O. J. Sands, president American National Bank; Coleman Wortham, of Davenport & Co., bankers; T. S. Wheelwright, vice-president Old Dominion Iron & Nail Works Company, all of Richmond, Va.; Frank J. Gould, capitalist, New York; W. R. Williams, formerly secretary Richmond Locomotive Works, and O. P. Redford, formerly engineer for the same company. Jonathan Bryan is president of the company; W. R. Williams, vice-president and treasurer, and O. P. Redford, secretary and general superintendent.

The business of the company was the making of special

cemented pit just below the level of the ground and contain the fuel oil used in all heating furnaces. This fuel oil is also used in a large De La Vergne engine supplying all the power required. This engine is directly connected with the main shaft of forge shop No. 1 by a Dodge rope drive and it also runs a generator supplying electric current to all other shops. This engine is of the most modern type and makes the necessary power at a cost of about 6/10c. h.p.h.

At this new shop there are steam hammers varying in size from 400 to 7000 lb. and board drop hammers from 1000 to 3000 lb., in addition to the auxiliary machines. While there are other drop forging shops in the country larger, the company states that there are none better equipped and probably no one has quite all the advantages of this new shop, which has been designed to overcome the troubles known only to experienced drop forging men and to reduce manufacturing expenses to a minimum.

Acca has not heretofore been a station, but the Richmond-Washington Railroad, with its usual enterprise and its spirit of cooperation has made Acca a station for the Richmond Forgings Corporation, taking the most favorable freight rates which are given to the city of Richmond and delivering all freight on the tracks of the company. It also stops a number of its passenger trains going north and south for the accommodation of the Forgings Corporation and runs a special train from the city to Acca bringing the employees to the shop by 7 a. m. and taking them back at 6 p. m., and putting in a special rate of five cents for tickets in large lots, which are purchased by the company and sold to its employees.



Plan of the New Shops of the Richmond Forgings Corporation, Richmond, Va.

drop forgings of every description from any kind of material which could be forged, but no machining was done except in the preparation of the dies, tools and repairs.

The activities of the company were not local, but it sought business successfully throughout the North into Canada and to the Mississippi River. So vigorously was the business pushed that several additional hammers and various machine tools were added to the equipment, and it soon became evident that the business was outgrowing the building and facilities available at Belle Isle. About one year ago the capital stock was increased to \$200,000 and it was determined to move the plant and to provide abundant room in order that the company might undertake the finishing of various tools and parts which could be made from drop forgings.

The present site, consisting of 28 acres of level ground, is situated within one mile of Richmond and at the junction of the Richmond-Washington Line, the Atlantic Coast Line and the Seaboard Air Line railroads. The Seaboard tracks enter the south end of the yards and the Richmond-Washington tracks enter from the north and these tracks extend throughout the yards of the company in such a way as to reduce the cost of handling materials to a minimum. It will be noted from the accompanying ground plan that the tracks extend over 1000 ft. along one side of the property, while a broad avenue borders the north side. There is a gentle slope from the southern to the northern end of the yard, so that all material, such as raw stock, is easily run from the yards to the shears, thence to the forge shop, and forgings from the forge shop to the pickling and heat treating rooms and on to the shipping rooms.

Large tanks of 30,000 gal. capacity are located in a

The Richmond Forgings Corporation can now supply at its new shops forgings weighing singly a few ounces or several hundred pounds. This is strictly a Southern industry and illustrates the rapid growth of manufacturing in that section. It further demonstrates the ability of factories of this kind to compete with similar factories throughout the North and West, as the company is now selling its product from Boston to Detroit and from Canada to the Gulf of Mexico, and is able to handle all this business at a fair profit, due to its low manufacturing cost. The establishment of this successful plant at Richmond is expected to be influential in encouraging other factories to locate in the South. They can now get the materials needed, which not long ago could be secured only in the North.

The Sunshine Coal & Coke Company, First National Bank Building, Uniontown, Pa., miner of coal and maker of foundry and furnace coke, advises through J. B. Topham, its general manager, that it is operating six of its plants in Fayette and Westmoreland counties, Pennsylvania, which aggregate about 75 per cent. of its oven capacity. The greater part of this capacity is on furnace coke, the balance being on its foundry brands, Hester, Cyrilla, Francis, Chester and Eleanor, which are meeting with increasing favor among foundrymen. The company is also mining and shipping a good quantity of coal, and taken altogether is operating to a greater extent than most of the coal and coke companies in the region. It is not curtailing any development and improvement work it had contemplated and is bringing its holdings to a higher state of efficiency when this can be done.

The Rotrex Pump

A New Rotary Type for Producing High Vacuums

A new type of rotary high-vacuum pump known as the Pratt Rotrex vacuum pump is being constructed by the C. H. Wheeler Mfg. Company, Lehigh avenue and Eighteenth street, Philadelphia, Pa. This pump represents a very recent development in the line of high-efficiency vacuum apparatus and is of the single rotor type. It is designed for steam, belt or motor drive, and is built in a number of sizes to suit any ordinary power plant. Axial and end sections and an end elevation of the pump are given in Fig. 1, while Fig. 2 shows an application of it for steam turbine drive in conjunction with a centrifugal circulating pump.

As will be noticed from Fig. 1, the construction is very

vided which are arranged so as to take any overload without excessive shock. The power requirements are very low on account of the minimum number of moving parts, and the improved discharge valve arrangement enables the rotor to operate with vacuum on both sides until the discharge point at the end of each revolution is reached.

In Fig. 2, a steam turbine-driven outfit is shown where the Rotrex pump and a centrifugal circulating pump are driven either directly or through reduction gears from the turbine. One of the advantages of this arrangement is simplicity as well as the small amount of floor space required. At the present time this combination is being supplied quite extensively to surface and low-level jet conductor equipments. Other applications of the pump are in connection with a centrifugal circulating pump and a hot well lift pump mounted on the one base with a surface condenser. In one of the latter units a pump having a rotor 12 $\frac{3}{4}$ in. in

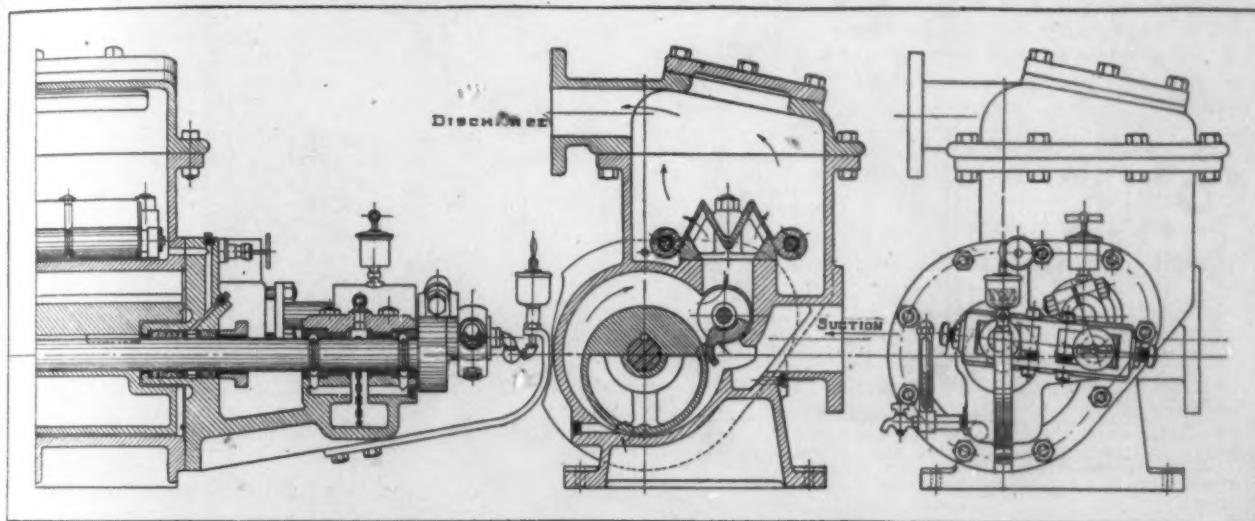


Fig. 1.—Axial and End Sections and End Elevation of the Rotrex Pump Built by the C. H. Wheeler Mfg. Company, Philadelphia, Pa.

simple, and the pump consists of a cylindrical casing and a rotor mounted eccentrically on a heavy shaft. This shaft is carried in outboard ring-oiling bearings, which are entirely independent of the stuffing boxes. The division between the suction and the discharge space in the pump cylinder is maintained by a radius cam carried on a shaft which is journaled in bearings that are also independent of the stuffing boxes. This cam shaft is operated from the rotor shaft by a lever and a crank on the outside of the casing, the arrangement being clearly shown in the end elevation at right of Fig. 1. The eccentric rotor revolves in the pump casing bore, with a clearance, as is clearly

diameter and 32 in. long was installed in conjunction with a 3000-sq. ft. surface condenser for an 800-kw. steam turbine. The pump rotor revolved at a speed of 240 rev. per min. and the circulating water entered at 74 deg. F., and was discharged at a temperature of 16 deg. higher. When steam for a load of 775 kw. was being condensed, the vacuum maintained as measured on a mercury gauge was 28.2 in. At the time the test was made, the barometer was 29.58 in., and, assuming that the temperature at which the water left the condenser was 80 deg. F., the pump maintained over 90 per cent. of the possible vacuum, which was about 28.57 in.

The manufacturer guarantees that on dead-end test this

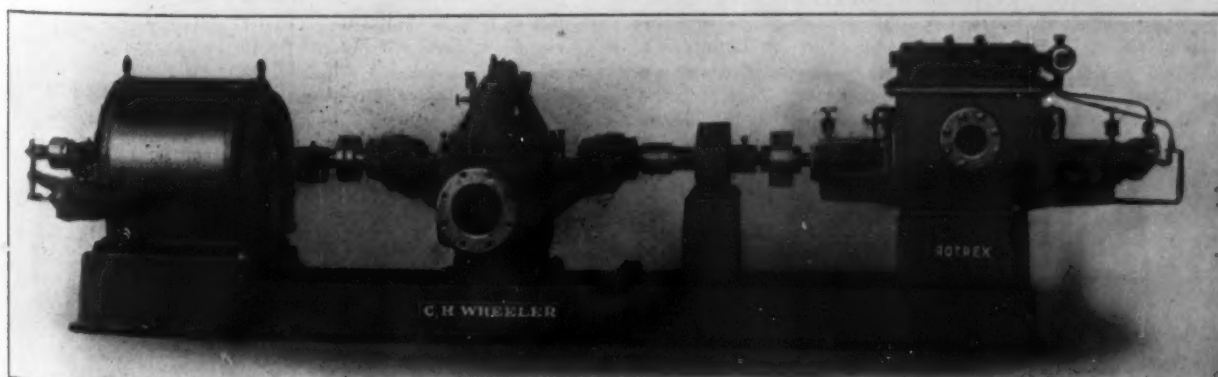


Fig. 2.—A Turbine-Driven Pratt Rotrex and Centrifugal Pump Combination.

brought out in the central portion of Fig. 1, and the cam for maintaining the division between the two parts of the pump can be adjusted to give the same clearance between itself and the rotor as exists between the rotor and the casing. These clearances are sealed by water fed from the discharge chamber, and the arrows show the flow of the water. There are no rubbing parts or sliding fits in any portion of the suction or the discharge space. At the entrance to the discharge chamber metal flap valves are pro-

pump can produce a vacuum within $\frac{1}{2}$ in. of the barometer, and will maintain it within 1 in. of the barometer under operating conditions. Ordinarily, the pump is of the wet-vacuum type and handles both air and water, but if it is to be used for dry-vacuum service a small connection is made into the suction to furnish the necessary sealing and cooling water. The amount required for these purposes is said to be less than that needed by a reciprocating dry-vacuum pump.

The Harris Transmission Gear

A New Device for Driving Shafting at a Reduced Speed

The Transmission Gear Company, 96 Broadway, New York City, has brought out a number of new types of transmission gears, among which is one known as the Harris transmission gear. This device is intended to be coupled directly to the motor shaft or driven by a belt when used on separate lines of shafting, or on separate machines. It may also be mounted on the engine bed plate or motor frame. It is designed to be used wherever any change in speed, either an increase or a reduction, is desired from the normal one of the driving shaft. Its use is said to effect a very large reduction in the amount of belting required for power transmission.

Two general types of gears are made, one with a per-

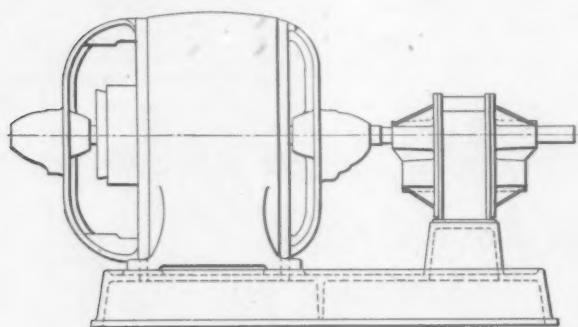


Fig. 1.—An Electric Motor Driving Through the Class A Harris Transmission Gear, Made by the Transmission Gear Company, New York City.

manent speed change between the motor and ventilating fans and blowers, air and centrifugal pumps, propellers and general machinery, while in the other type the normal speed as well as one or more changes can be secured. The first, which is known as the class A gear, is illustrated in Fig. 1 as installed in connection with an electric motor, while a view of the different parts is given in Fig. 2. The class B, or second type of gear, is shown in Fig. 3, with the cover removed, and Fig. 4 is a sectional elevation of the gear.

In the construction of the gears special metals cut to the exact diameters and then hardened are used. The bearings, which have ample proportions, are made from a special grade of bronze. In this way a smooth and easy-running yet rigid machine with a maximum amount of service is secured. Provision is made for taking up any wear occurring in the gears and the bearings, and the lubrication is automatically accomplished by maintaining a continuous flow of oil over the gears and through the bearings.

In the class B gear shown in Figs. 3 and 4, the change in the speed of the driven shaft is secured by shifting the long lever at the top of the gear. When this lever, which is denoted by *c*, Fig. 4, is at the left, the speeds of the driving and driven shafts are the same, while by throwing

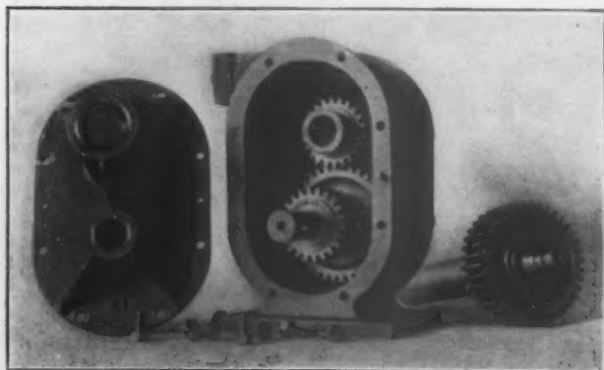


Fig. 2.—View Showing the Parts of the Class A Gear.

the lever to the right an increase or reduction is secured in accordance with the ratio of the back gear arrangement. Referring to Fig. 4, which shows in section the

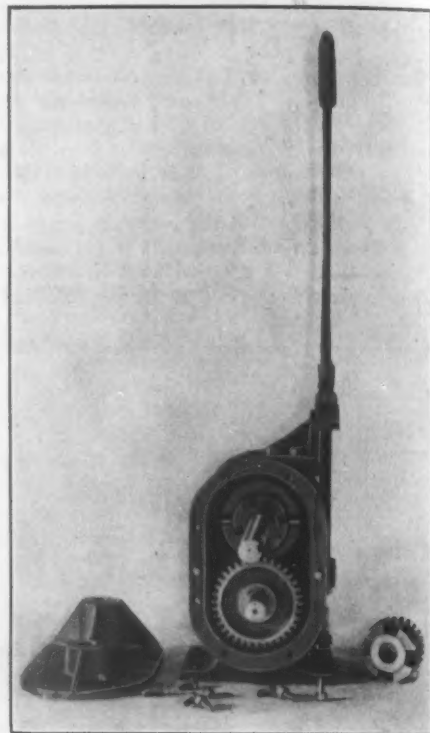


Fig. 3.—The Class B Gear With the Cover Removed.

arrangement of the various parts, *a* is the driving shaft and *b* the driven. When the handle *c*, operating the gear, is in the position shown the shaft *b* is not engaged. When the shaft *a* is driving through the back gears, the keys *d* engage in the jaws *e*, which are cut in a sleeve mounted on the shaft *a*. This causes the gear *f* to mesh with the gear *g*, the latter transmitting its power through the short lower shaft to the gear *h*, which in turn engages with the one *i*, securely mounted on the driven shaft. When it is desired to drive the driven shaft at the same speed as that of the driver, the lever *c* is thrown to the left, which causes the keys *d* to engage with the jaws *k*.

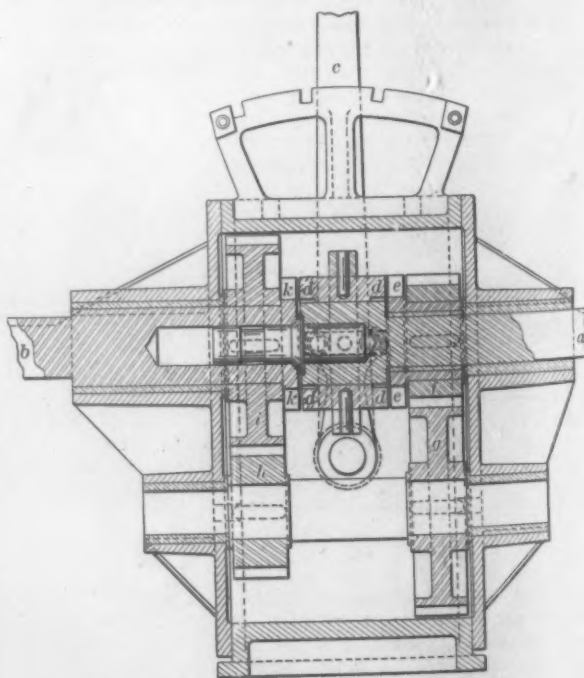


Fig. 4.—Sectional Elevation of the Class B Gear.

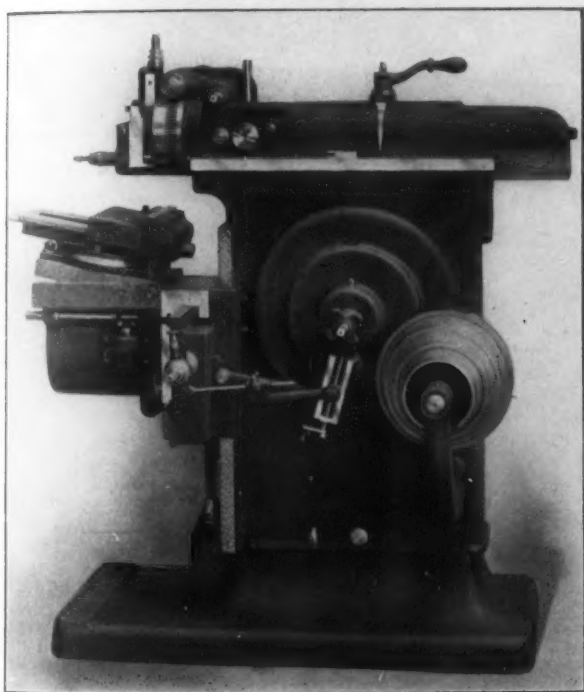
The company is prepared to furnish these gears for transmitting any desired power, and besides its regular stock ratios can supply any ratio of gearing up to 100 to 1.

The Stockbridge 16-Inch Single Geared Shaper

In a tool room or for doing die work a universal shaping machine capable of being worked to or within limits is required. The Stockbridge Machine Company, Worcester, Mass., has developed a 16-in. single geared shaper with a number of special attachments, which will fulfill practically all the requirements of this class of work. One of the special features of the machine is the mounting of the power rotary feed for the tool slide on the top of the ram.

A worm and worm gear, the former connected through a train of gears to the pawl on the side of the ram, revolves the head. The amount of feed to the worm gear is determined by the amount of throw of the pawl, which is reciprocated by a dog that is adjustable along the ram gib to vary the amount of throw of the pawl. The worm can be rotated in either direction and its construction is such that if desired the head can be rotated by hand. Two bolts on either side of the head provide a means for locking the rotary head when it is not in use to the ram head.

Automatic feed in either direction is provided for the head slide and its amount is regulated by the position of the dog on the ram gib. The down feed has an automatic stop, which can be used to advantage in producing duplicate



A New 16-in. Single Geared Shaper for Toolroom and Die Work, Built by the Stockbridge Machine Company, Worcester, Mass.

work. This stop prevents the tool from feeding down too far and spoiling the work, and at the same time enables the operator to attend to other work while the machine is running. The down feed screw has a micrometer which is graduated to read in thousandths of an inch and can always be set at zero. If desired, the feed to the slide can be operated by hand. The shaper is equipped with a swiveling or rotary knee having two working sides. This knee is revolved by a worm and worm gear through an arc of 90 deg. in either direction. One of the working sides is arranged to tilt for planing angles and is useful in die making. All the feeds and the adjustments are located within easy reach of the operators.

The following table gives the principal dimensions and specifications of the machine:

Length of stroke.....	16½ in.
Vertical travel of knee.....	16 in.
Horizontal travel of knee.....	20½ in.
Length of ram bearing in column.....	26 in.
Weight of machine.....	2000 lb.

In common with the 24-in. shaper and the 16-in. back geared shaper which were illustrated in *The Iron Age*, March 24 and October 27, 1910, respectively, and all the others made by this company, the new machine is equipped

with the Stockbridge two-piece crank. This crank, it is claimed, delivers all the power developed by the driving shaft to the tool point and in addition secures an even cutting speed throughout the length of the cut with a quick return of 3.5 to 1. This quick return is maintained on short strokes. No jar is sustained by the machine due to the high rate of return, as the speed, while great during the middle of the stroke, is gradually accelerated and retarded by the construction used, and the stroke is thus reversed easily and smoothly.

The German Foundrymen's Association

The Verein Deutscher Gie Bereifachleute (German Foundrymen's Association) will hold its annual meeting in Berlin May 25 to 28. The programme provides for a visit to the foundry of the German Niles Tool Works at Oberschöneweide. A paper on "A New Molding Process for Making Hollow Castings" will be read by Prof. Dr. Ing. A. Nachtweh, Royal Technical Institute, Hanover, illustrated by cinematographic pictures. A lecture on "The Present State of Metallography with Special Reference to Foundry Practice," with cinematograph pictures, will be delivered by Dr. F. Bennigson, Berlin. Papers will also be read on "The Rotary Fore-Hearth," by Th. Löhe, foundry expert and engineer, Hanover, and "The Use of Oil as a Heating Material in Foundries," by Oberingenieur Karl Schiel, Berlin.

The National Building Material Exhibition

The recent great loss of property and life through fire disasters has brought prominently before the trade and the public the fact that the National Building Material Exhibition, which is to take place at Madison Square Garden, New York City, September 9 to 16 inclusive, is to be held at a time when such a show has become a real necessity from an educational standpoint. The inadequate fireproofing of our so-called fireproof buildings, both private and public, has brought home to the American public the absolute necessity for a complete revolution in the field of building construction. The work that ex-Chief Edward F. Croker, who has long been recognized as America's greatest fire chief, has taken up for the prevention and protection of property and lives from disastrous fires, has aroused and brought about the commendation of the public and press of the entire country. An interesting feature of the show will be an exhibition by Mr. Croker demonstrating methods of fire prevention.

The project of the Building Material Exhibition will be primarily to afford architects and manufacturers of building materials, both exterior and interior, and building appliances an opportunity to get into closer touch not only with each other, but with the public at large. Expressions of approval and hearty co-operation have followed the announcement of the enterprise from all quarters. Noted architects have publicly voiced their appreciation of the fact that the exhibition is now an assured thing. Benjamin D. Traitel, president of the Building Trades Employers' Association of New York City, writes a letter of indorsement. The Mechanics' and Traders' Exchange has also placed the stamp of approval upon the project. The scope of the show, as its name implies, will comprise a large field, including everything of interest to the architect, the general builder, the manufacturer and the consumer of interior and exterior appurtenances of every description, and to the layman householder. The executive offices of the promoters are located in the Flatiron Building, suite 508-9, New York City, the general management of the show being under the direction of P. T. Powers.

It is officially announced that the steel plant and rail mill of the Tennessee Coal, Iron & Railroad Company at Ensley, Ala., will be put in operation again in June. If some orders are booked that are now expected to come in, the rail mill will resume early in that month.

The Producers' Coke Company, 732 First National Bank Building, Uniontown, Pa., maker of Connellsville furnace and foundry coke, has appointed the Black Gem Coal & Coke Company, 1535 Old Colony Building, Chicago, as its sales representative for that district.

Pawling & Harnischfeger Cranes in a Material Yard

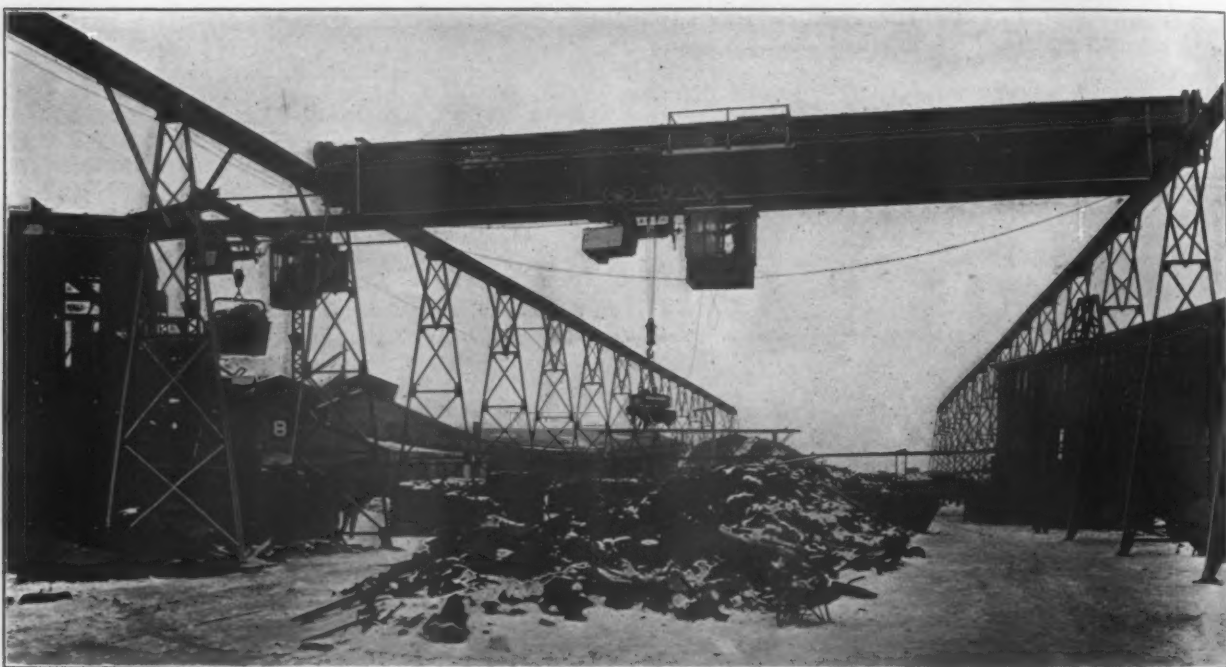
An interesting installation of an electric crane serving the factory yard and transporting materials for charging the cupolas at a minimum cost has been made at the plant of the Simmons Mfg. Company, Kenosha, Wis., by the Pawling & Harnischfeger Company, Milwaukee, Wis. This installation consists of one 60-ft. span electric traveling crane and one 5-ton and one 3-ton standard two-motor electric traveling hoists with inclosed trailing operators' cages. One of these hoists is equipped with an electro-magnet for handling pig and scrap iron, while the other has a large capacity dumping bucket for carrying coke and other raw materials. The operating speed of the bridge and the two hoists is from 400 to 450 ft. per minute.

The structural runways for the crane bridge are 400 ft. long and consist of lattice-riveted plate girders kept in position by structural frame ends. Two 15-in. I-beams are suspended on 5-ft. centers from the underside of each girder and form the runways for the traveling hoists. The bridge travel motor and the driving mechanism is located on one of the girders, while the controller is located in the

way. This enables one or both of the hoists to run off the crane onto the spur to deposit the iron, coke or other material constituting their loads, and at the same time furnishes a reserve in case of breakdown as the hoists can be used interchangeably with the lifting magnet or the grab bucket if necessary.

Foreign Tariff Work of the Bureau of Manufactures

The Bureau of Manufactures of the Department of Commerce and Labor, Washington, D. C., is planning to make its foreign tariff work more directly helpful to manufacturers and exporters of the United States. It possesses exceptional facilities for supplying the latest exact information concerning tariff rates and the customs formalities incident to the entry of goods into foreign countries. In addition to the latest official customs tariffs of nearly all foreign countries, customs decisions and other official publications to the number of 1000 a month are regularly read and filed to keep the tariffs fully up to date. The tariff publications of the bureau, which are



The Traveling Transfer Bridge and Electric Hoists Installed in the Material Yard of the Simmons Mfg. Company by the Pawling & Harnischfeger Company, Milwaukee, Wis.

cage of the 5-ton hoist, which is the one equipped with the electro-magnet. The 3-ton hoist can also be used on the bridge, but its controller cannot be used for regulating the travel of the bridge. The crane, which is of the double-beam, swivel-truck transfer type with lift of 19 ft. 2¼ in., is covered to protect it from exposure to the weather. The hoisting speed of the 5-ton hoist, which is equipped with swivel trucks, is 50 ft. per minute for a light load, 40 ft. per minute for a 3-ton load and slightly less for a 5-ton load.

Prior to the installation of the crane, small cars running on narrow-gauge industrial tracks and elevators were used to supply the material for charging the three cupolas of the plant. This required the services of from 25 to 30 men working 10 hours per day. With the electric crane and two hoists the number of men required for this work was reduced to three or four, and these have sufficient time to unload material from the cars in the yard, one or two of these being on the ground, while the other two operated the electric hoists. The amount of power consumed by this crane is comparatively small.

As is clearly shown in the engraving, there are a number of I-beam spurs which run from the structure of the crane runway to the various cupola buildings. These spurs are intended to be in exact alignment with the beams on the crane bridge, and a latching device operated from the hoist cage enables the crane to be kept exactly opposite the run-

being extended as rapidly as possible, now fall into the following general classes:

1. The translation and publication in pamphlet form of the entire customs tariffs of particular countries, with such explanatory matter as seems desirable. The customs tariffs of Germany, Italy, France, Mexico, the United Kingdom, Australia, New Zealand and several other British colonies have already been published.
2. The publication in similar form of rates of duty of all countries on particular classes of commodities—for example, leather and leather manufacturers, agricultural products, and machinery of every description. Similar pamphlets give the regulations governing commercial travelers abroad and the consular regulations of all foreign countries.
3. All proposed and recent changes in rates or regulations of foreign countries that affect imports of merchandise from the United States are given publicity through the columns of the Daily Consular and Trade Reports immediately upon their receipt, and for convenience of reference are assembled and issued separately, as often as is deemed necessary, under the title, "Foreign Tariff Notes."

A list of individuals and firms engaged in foreign trade is being formed, showing the articles of merchandise and the countries in which each is particularly interested, with the two-fold object of keeping exporters fully informed of all tariff changes abroad and of selecting for immediate treatment the subjects that will prove most generally helpful. To facilitate the compilation of such a list a circular letter is being sent out to the trade, and copies may be obtained from the Bureau of Manufactures.

Forming Special Shapes by Cold Rolling of Standard Sections

Important American Development for Quick Supply of Metal Furniture and Building Mouldings and of Shapes for Implement, Automobile and Other Manufacturing

A cold-rolling plant for the manufacture of irregular shapes and special rolled steel sections has been established by the Garrett & Amberg Company, at Forty-seventh and West Kinzie streets, Chicago, Ill. No reduction from billets or hot rolling of any kind will be done, the company restricting its operations exclusively to the re-shaping of standard sections, band-iron and flat-strip steel into almost any shape that can be designed or desired.

It has always been difficult to secure special sections from mills unless a large tonnage was ordered or unless there was a chance of developing a demand in other quarters; and even under these conditions the business was frequently unwelcome and subject to exasperating delays and deliveries. This indifference, largely because of the special equipment required for the production of special shapes, has left this department of the steel business in America in a somewhat undeveloped stage. Foreign mills have endeavored to cater to the demand, but the slow deliveries and

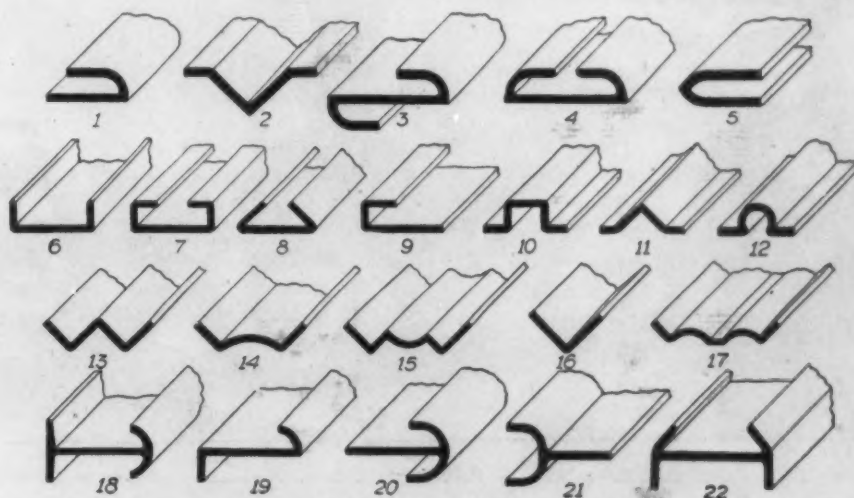
facturers, car builders, automobile makers and the hardware trade generally demand a heavy line of special shapes of even greater variety.

All sections are made in a very few operations; in fact, the greater number of shapes are made in one or two passes, a procedure calculated to bring the producing cost low. The manufacturers claim that the steel used can have any finish desired, as the re-rolling or re-drawing process does not destroy the original finish on the steel as it comes from the mill. The offices of the Garrett & Amberg Company are at 1713 Fisher Building, Chicago.

New Publication

THE IRON ORES OF LAKE SUPERIOR. By Crowell & Murray. Cloth bound; pages, 186, 6 x 9 in.; inserted maps and data sheets. Published by the Penton Publishing Company, Cleveland, Ohio. Price, \$3.50, postpaid.

Considering the vast amount of information, statistical and descriptive, that has appeared in the past 25 years relative to Lake Superior iron mining, it is surprising that no handbook of the industry has appeared until now. The authors of this book, whose task has been in large part one of compilation, are chemists and metallurgists at Cleveland and their work has put them in possession of much data from original sources. They give in the earlier part of the book a brief history of Lake Superior iron ore discovery and development, with chapters on the geology,



Standard Sections, Band-Iron and Flat-Strip Steel Reshaped by Cold Rolling by the Garrett & Amberg Company, Chicago, Ill.

other restrictions have hampered their efforts

With the Garrett & Amberg plant in operation, which is the only one of its kind in the West, it will be possible to secure special sections in any quantity at a comparatively moderate price, and in a reasonably quick period, providing such sections can be rolled or drawn cold from some standard form of steel.

The accompanying illustrations show several sample sections that are being produced regularly. Figs. 1 to 5 inclusive and Figs. 18 to 22 inclusive show types of shapes re-rolled from I beams, angles, channels, tees and zee bars; while the other cuts show the variety of shapes drawn from flat strip steel and band-iron. The distinction between re-rolled and drawn sections is that the former process is usually used on such steel as comes from the mills in lengths under 50 ft., while the latter method is used on band-iron or flat steel which comes in any form of hoops or scrolls.

In Fig. 1 is shown a standard angle-iron with one leg formed parallel to the other, making a special U-shape section. Fig. 5 shows another U section with both legs of the angle bent equally. Another type is made from the standard angle shape as shown in Fig. 2, where a part of both legs of the angle is bent outward to form a track or grooved section. Figs. 3 and 4 and all of the figures on the bottom row show the application to the flanges of zee bars, I beams, channel irons and tees.

Figs. 6 to 17 inclusive show just a few of the innumerable shapes that can be drawn from flat steel. Their uses are mainly for moldings on steel furniture, building interiors, steel window sash, doors, etc. Implement manu-

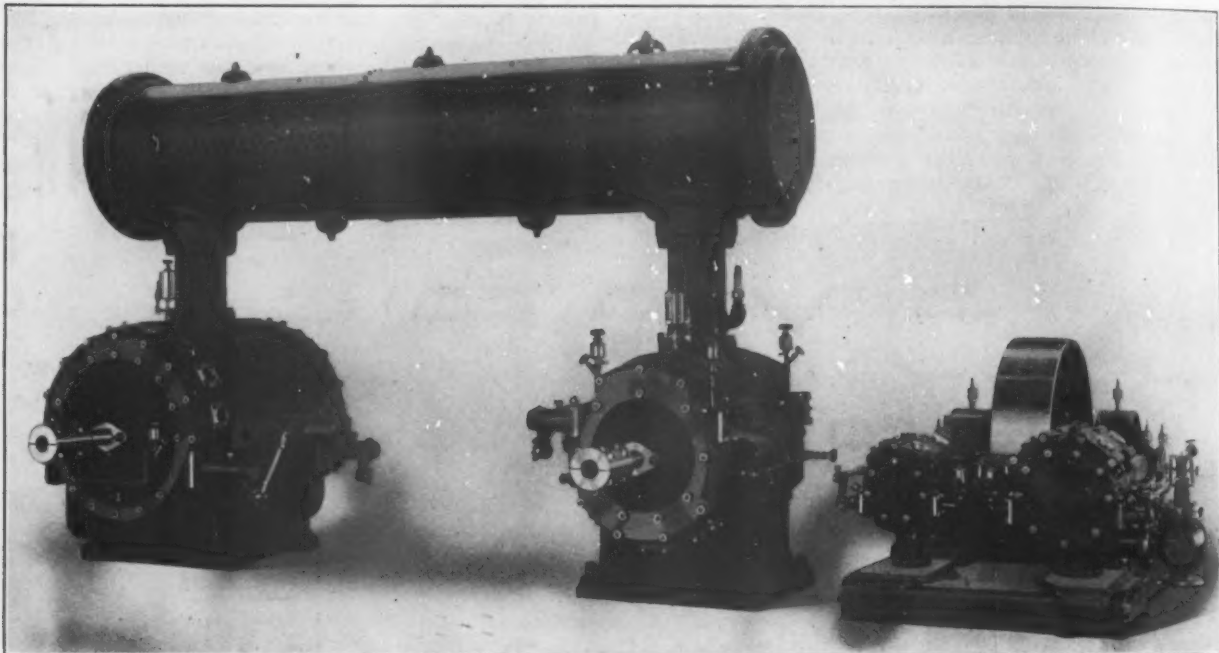
mineralogy and mining methods of the region. The transportation of ore is briefly described, while considerable space is given to the classification of ores, sampling and methods of analysis. The rather intricate system of arriving at the values of Lake Superior ores on the basis of their chemical analysis is elaborated upon, the explanation showing more closely the scheme adopted by the Lake Superior ore shippers graduates the price according to the actual value of the ore to the furnaceman. The penalties for lower iron content and higher content of metalloids advance as the percentage of iron diminishes and are intended to represent as closely as may be the larger outlay of the furnaceman for fuel and fluxes and the higher unit cost due to diminished pig iron output. The greater portion of the book is given up to details of the various mines and ores, with location, ownership, shipments by years and analyses, dried and natural. Valuable data sheets are inserted which give graphically the shipments from the various ranges by years and the loading and unloading equipment of the various docks; there are also several maps, one containing all the ranges while a more detailed map is devoted to each range. Probably so much of the data generally inquired for concerning Lake iron ores and mining has not been brought together before in a single volume. The authors have done a service to the entire trade they represent and the result is highly creditable.

The Walsh Mfg. Company, Pittsburgh, organized recently for manufacturing light machinery, has purchased a plot, 120 x 120 ft., on Jane street, Pittsburgh, and will erect a factory building.

The Contrast in Air Compressors

An interesting commentary upon the wide range of sizes of air compressors manufactured by the Chicago Pneumatic Tool Company, 1010 Fisher Building, Chicago, Ill., is afforded by a photograph recently taken on the testing floor of the company's air compressor works at Franklin, Pa. The two compressors shown are very dissimilar as regards size and the use to which they will be put, although both represent the latest designs of their kind.

The air cylinders at the left with the overhead inter-cooler form the air end of one of the two Corliss engine-driven air compressors which will be installed in the new Grand Central Terminal, New York City. The diameters of the low and the high-pressure cylinders are 23 and 13 in., respectively, and the stroke is 24 in. When operating at a speed of 90 rev. per min. a displacement of 1038 cu. ft. of free air per minute is provided. These



Two Very Different Air Compressors Recently Built by the Chicago Pneumatic Tool Company, Chicago, Ill.

cylinders have mechanically actuated intake valves and are arranged for direct connection to the steam end, which has cylinders 24 and 14 in. in diameter and a 24-in. stroke. The other compressor which this company is building for the Grand Central Terminal will have a displacement of 2031 cu. ft. of free air per minute. This larger displacement is due to an increase in the size of the steam and air cylinders and a change of the operating speed. In this compressor the steam cylinders are 17 and 30 in. in diameter, and the two-stage air cylinders are 28 and 17 in. in diameter, the stroke being the same as in the other unit, 24 in. The operating speed is 95 rev. per min. The smaller compressor at the right was built for the company's Russian branch house, and is a belt-driven two-stage machine having mechanically actuated intake valves and a capacity of 197 cu. ft. of free air per minute.

The line of compressors built by this company comprises more than 100 sizes and styles, and can be used for every purpose employing compressed air. Some of the special uses to which these compressors are put are operating pneumatic tools, compressing natural gas, pumping water by the air-lift system, in mining and caisson work, and for a great variety of purposes in industrial establishments.

The Eureka Steel Company, Pittsburgh, which placed its new plant in operation last week, is arranging to increase its capital stock from \$25,000 to \$250,000 and is preparing plans for a new open hearth furnace, a blooming mill and a bar mill. It has completed a small plant for the manufacture of automobile parts and tool steel. The main building is 45 x 110 ft. The officers of the company are: G. B. Smith, president; J. J. Tattigan, vice-president, and George D. Hutshon, secretary-treasurer.

The H. C. Frick Coke Company's Safety Committee

A committee of safety composed of nearly 500 employees of the H. C. Frick Coke Company, has been organized to look after the welfare of the thousands of employees of that company in the Connellsville coke regions. A recent issue of the Courier of Connellsville, Pa., contained the following account of the organization of this committee and its plans:

A permanent safety committee is established in each plant, consisting of the superintendent, mine foreman, assistant mine foreman, fire bosses, rib bosses and boss driver. In addition to, and working in connection with, this permanent committee there is a committee composed of three workmen, who serve for six months, when three other workmen are appointed.

Every week the committee gets together, and anything affecting the safety of the employees is taken up and

thoroughly discussed. One plain fact is recognized by all—no accident is without its cause, and it is the duty of the safety committee to ascertain the cause and apply the remedy.

A written report is made of every accident resulting in personal injury, or that might in any way endanger the lives of the men. This report, which is prepared by the head of the department in which the accident occurred, gives every detail, and is taken up for general discussion, with a view of devising some means of preventing recurrence. The fullest expression of opinion is encouraged, and no suggestion is ignored. Each plan is carefully considered, its good and bad points are gone over and impartially weighed, and the suggestion is accepted or rejected, as the committee decides. A report of each case and the conclusion arrived at as to the method of preventing similar accidents is sent to the general superintendent's office at Scottdale, from where it is transmitted to the other plants.

Each member of the permanent safety committee wears an attractive blue enameled button, around the edge of which are the words, "Permanent Safety Committee," and in the center "H. C. F. C. Co." in monogram. The movement is a most laudable one and has aroused unbounded enthusiasm among the employees.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., has received a contract from the Portsmouth Steel Company, Portsmouth, Ohio, for the building of two Junt roughing mills, three finishing mills and three cold mills. This will give the company in its sheet department three jobbing and five sheet mills, with the necessary cold mills. These mills are expected to be ready for operation in the fall.

Holbeck Gas Plants for Bituminous Coals

Gas producer apparatus, designed especially to use bituminous coals and lignites, and interesting particularly in respect to a rotary washer for cleaning the gas, is made by the Holbeck-Riverside Gas Power Company, Oil City, Pa. The accompanying drawing indicates the general features.

The generator is of the pressure type, steam blown, and is shown equipped with automatic fuel feed. The generator revolves on steel trunnions making about one complete revolution every 10 min., and the fuel is agitated by means of a water-cooled cast-steel poker automatically oscillated. The gas generated passes through the water space of the cooler and then through the rotary air washer, both of which parts of the equipment are designed to recover the tar carried over from the generator. Beyond the gas washer the gas passes through a dry scrubber and is then ready for distribution to the gas engine installation, or the melting, annealing, case hardening, tempering or other furnaces equipped for the use of gas fuel. The operation of the producer gas power plant may be described as follows:

Bituminous crushed, nut or slack coal, stored in a

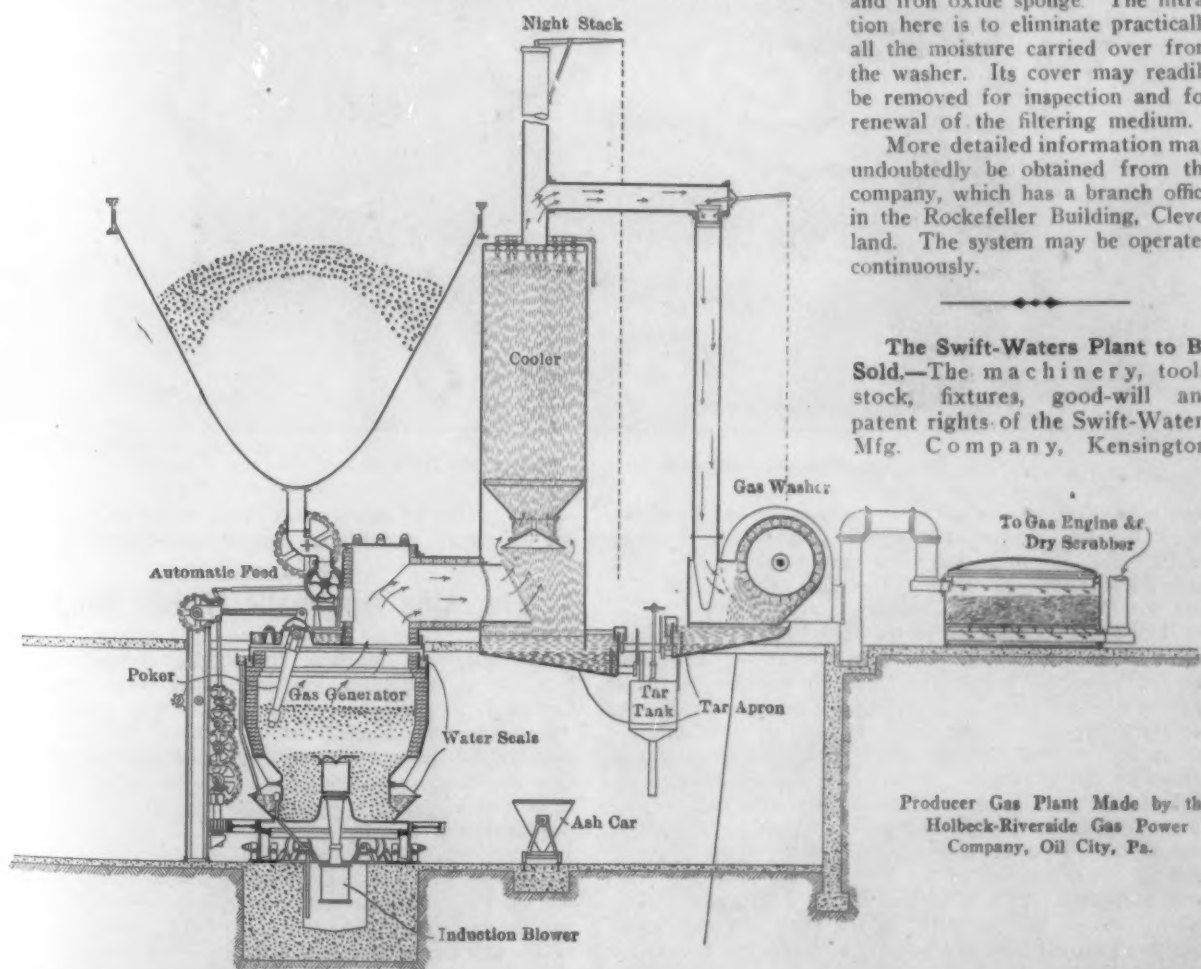
The cooler is a tall, riveted steel tank with sprinklers at the top and an arrangement to bring the hot gas in as intimate contact with the spray as possible. The tar and other impurities are caught on the apron in the water seal below the cooler. The gases leaving the cooler reach the gas washer, where a rapidly revolving drum is designed to throw out the tar bubbles still remaining. A film of water covering the interior of the casing of the gas washer is calculated to prevent the tar from adhering to the iron casing and otherwise clogging the washer, and the tar, as in the case of the cooler, collects on an apron in the water seal, finally being drawn off into the pot or tar tank, where, by means of compressed air or other ways, the tar may be sent to a storage tank for such use as may be made of it.

The rotary washer is regarded as the vital part of the plant. It is designed to effect the mechanical separation of the tar and moisture still in entrainment. The vanes on the revolving drum are placed so that the gas comes in contact with a water spray impelled in the opposite direction by the vanes. It is stated that the combined action of centrifugal effect and washing results in the purified gas containing not more than 0.015 grain of impurities per cubic foot. The washer also has impeller vanes, acting to draw the gas through the machine and to deliver it at uniform pressure without needing a gas holder.

The dry scrubber is a low tank containing excelsior and iron oxide sponge. The filtration here is to eliminate practically all the moisture carried over from the washer. Its cover may readily be removed for inspection and for renewal of the filtering medium.

More detailed information may undoubtedly be obtained from the company, which has a branch office in the Rockefeller Building, Cleveland. The system may be operated continuously.

The Swift-Waters Plant to Be Sold.—The machinery, tools, stock, fixtures, good-will and patent rights of the Swift-Waters Mfg. Company, Kensington,



Producer Gas Plant Made by the Holbeck-Riverside Gas Power Company, Oil City, Pa.

bunker as indicated, may be supplied in measured quantities through the drum automatically rotated along with the rotation of the generator itself. The scheme of intercepting measured amounts of fuel from the chute is clear, as is the means by which the cast-steel poker is oscillated as the fuel-filled generator rotates. Steam used at low pressure is introduced through the induction blower, which serves to draw in the proper amount of air. The water seals, by means of which the generator is kept tight, are indicated, and through the lower one are, of course, taken the ashes, an operation found to be necessary only about once in 24 hr.

The raw gas produced is made to pass through as short a connection as possible to the cooler, and this connection is brick-lined and provided with clean-out doors.

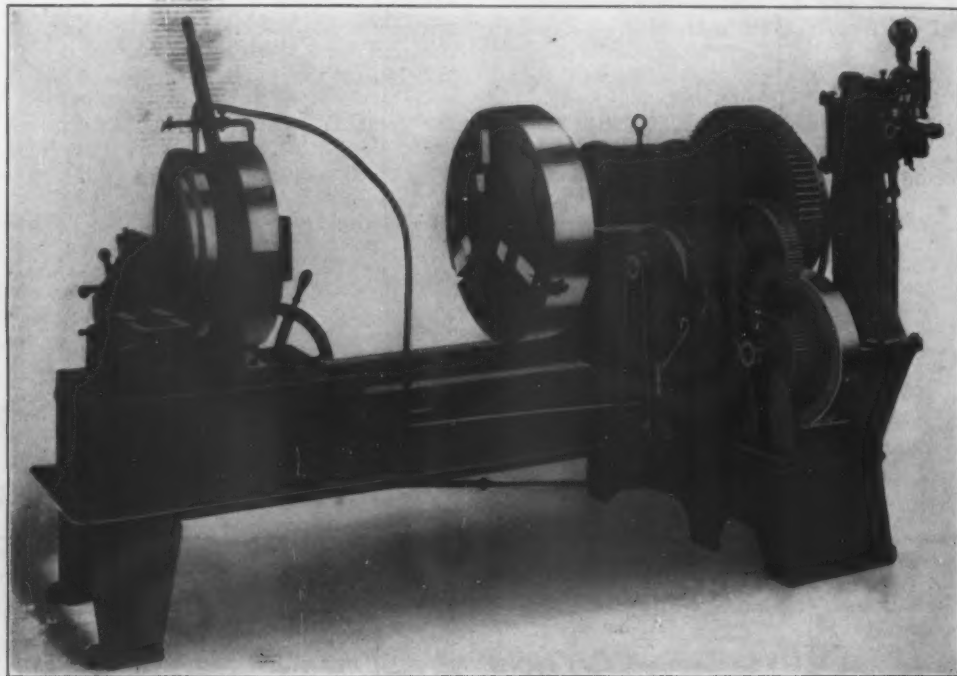
Conn., will be sold in one lot at public auction to the highest bidder, on the premises, on Wednesday, May 24, at 3 p. m. The property is in part as follows: One 15-hp. gas engine, 25-lb. Scranton hammer, Farrell press, American gas furnace, drill presses, lathes, shaper, polishing room outfit, handscrew machine, milling machines, dies and small tools, shafting, pulleys, belting, steam heater, typewriter and office fixtures. The machinery is in place and ready to start; much of it is nearly new. The property will be shown by appointment with the trustee, telephone Elizabeth 1483, Hartford, post office box 165, or with the auctioneer, Kendrick, Hartford.

The Williams 12-Inch Steamdriven Pipe Threader

A 12-in. pipe-threading and cutting-off machine driven by a direct-connected steam engine has been recently brought out by the Williams Tool Company, Erie, Pa. With the exception of the change in the drive, this machine is similar to the No. 5 pipe threader previously built by this company with either belt or motor drives. Both of these machines operated at a constant speed, the former being driven by a single pulley, while the power for the other type was supplied by a 5-hp. constant speed direct-connected motor. This machine is the outcome of more than thirty-five years of experience in designing and building pipe-threading and cutting machines, and an effort

rotary oil pump connected to the die head and the cut-off knife by a flexible steel hose, and dies of high-grade tool steel to secure the best cutting and lasting qualities. The last are easily resharpened, and when badly worn can be recut at a small cost. Eight sets are furnished, one for threading 3½ and 4-in. pipe, one set for 4½ and 5-in. pipe, and one set each for 6, 7, 8, 9, 10 and 12-in. pipe. But one die head is necessary, as a hinged latched cover plate on the front of the die head permits the dies to be quickly and easily changed and the die slots cleaned. Backing the pipe out of the dies after the thread has been cut is avoided, as the dies expand sufficiently to permit the pipe to be cut off or removed from the machine.

The machine weighs 10,000 lb. and requires a floor space 4 x 9 ft. By adding a set of nipple holders to the regular equipment nipples from 3½ to 12 in. can be cut,



A 12-In. Pipe Threading and Cutting-Off Machine, Built by the Williams Tool Company, Erie, Pa.

has been made to combine in it convenience and durability with the best devices for securing rapid and accurate work. Two of these machines have been recently built, one for the Arkansas Natural Gas Company and the other for the Diamond Alkali Company, Fairport, Ohio.

The engine is mounted on the same base as the machine, an arrangement which eliminates vibration. From the engine power is transmitted through machine-cut gears having a coarse pitch, thus making the machine a quiet and easy-running one. Eight speed changes are available, and these are secured through gears controlled by levers in front of the headstock. When it is desired to stop the spindle for putting in or removing pipe this can be done without stopping the driving gears. Complete control of the machine from the operating side is given the operator, and all gears are out of his way and are protected from dirt and chips. If it is desired to cut a left-hand thread, a pin releases the eccentric, which slips half-way round and is again engaged at a point that makes the engine run in the opposite direction.

The bed of the machine is of the lathe type and possesses the necessary weight and strength to insure rigidity under heavy strains. The headstock is bolted to the bed and is doweled to prevent it from getting out of line. The spindle is hollow, the pipe passing through it to the die head, which is strong and compact. It is mounted on a carriage that slides on broad ways, the carriage being moved backward and forward by a machine-cut rack and pinion operated by a hand wheel on the front of the machine.

The equipment furnished includes a graduated die head with a cam lever for setting the dies, a quick-operating, self-centering scroll chuck for steadying the pipe while it is being cut off, a device for duplicating threads on the same size of pipe, a rapid cut-off block just behind the die head with a chamfering tool for removing the burrs, a

and by adding an independent chuck to the rear end of the spindle flanges and fittings can be turned up.

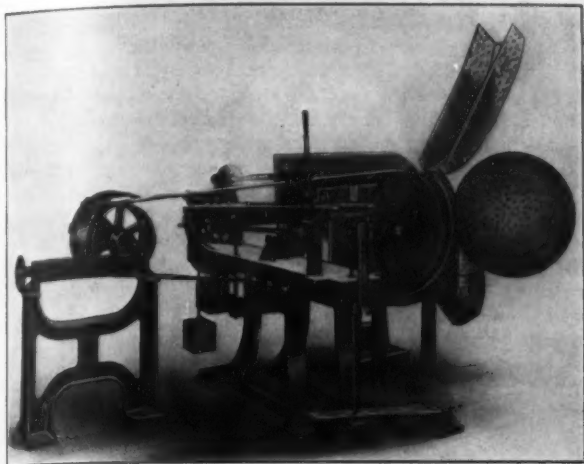
The Atha Automatic Handle Sander

An automatic machine for sanding adze or hatchet handles has been placed on the market by the Atha Tool Company, Newark, N. J. The sander was originally developed by the company for its own use and the success obtained has led it to manufacture the machine regularly. The machine was designed to take the place of skilled labor that is required to produce good work on sand belt machines and can be used in conjunction with modern sand belt stands and adapted to any horizontal belt.

The machine is located at right angles to the travel of the sand belt at approximately half the distance between the driving and the idler pulleys. The working portion of the belt passes over the bed of the machine and under the handle being sanded, while the lower part of the belt passes under the machine which is so designed that the belts can be taken off and put on without interfering with any part of it. The stands used should have sufficient height to locate the top of the belt 38 in. and the lower side of the belt 19½ in. from the floor. If the stand and the machine are not of the same height, blocking has to be resorted to to give the required distance, 18½ in., between the two belts. A surface speed of approximately 6,000 ft. per minute is recommended by the manufacturer for the sand belt which gives 200 rev. per min. of the 6-in. driving pulley of the machine. The distance between the pulleys of the sand belt should be approximately 5 ft. 3 in.

In operation the handle is automatically raised from the belt and the carriage returned to the starting point by the machine. The operator holds a rough handle loosely in his left hand and places the eye end in the chuck while

the lever controlling the movement of the dead center is pulled back with the other hand. He then holds the handle to the dead center, releases the lever controlling its movement and the center engages. The movement of the



A New Automatic Handle Sanding Machine, Built by the Atha Tool Company, Newark, N. J.

table is controlled by the treadle at the right of the machine and when pressure is applied to it the handle is brought down upon the belt and the machine automatically releases and feeds it across the belt until it is entirely sanded. After the operation is completed, the machine automatically trips and raises the handle from the belt. The operator then removes the finished product by releasing the lever with his right hand and puts another handle in the machine with his left.

With this machine a uniformity of finish is claimed to be secured which cannot be done when hand sanding is employed and if the handles are slightly chipped in turning, the flat spots are removed because the handle revolves steadily. About 3,000 adze hammer handles can be produced in a 10-hr. day on one of these machines. When operating on handles for adze eye tools or hatchets the round and the oval portions of the handles are sanded by the machine while the flat or square portion is finished by hand on the same belt by the operator.

The Hydromatic Water Valve

For controlling the water level in open-feed water heaters and for use on tanks, vats, cisterns, large water mains, etc., the Cleveland Steel Tool Company, Cleveland, Ohio, has placed a new water valve known as the Hydro-

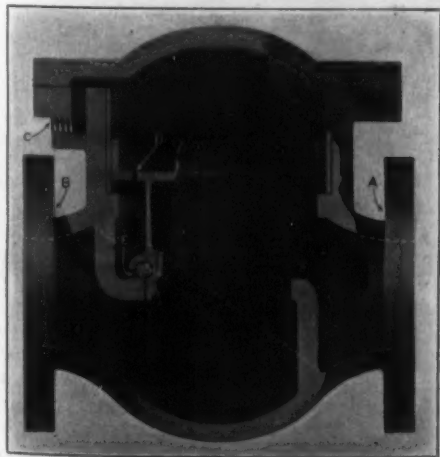


Fig. 1.—Section of the Hydromatic Valve, Made by the Cleveland Steel Tool Company, Cleveland, Ohio

matic valve on the market. The special advantages claimed for this valve, which is made in ten sizes, ranging from 1 to 8 in. in diameter, are the maintaining of the water level constant at all times within 1 in., the elimination of

leaky balance valves and the regrinding of balance valve seats, tanks and feed water heaters are prevented from overflowing, and a saving in water, coal and machine shop expenses is effected. The capacity is claimed to be greater than that of other valves of a similar rating, which is due to the form of its construction and the manner of its operation. The only part of the valve subjected to wear is the ring, which can be replaced without disturbing the piping in about 10 min. at a trifling cost. Fig. 1 shows an interior view of the valve, and Fig. 2 illustrates its application to an open feed water heater.

Referring to Fig. 1, which shows the construction, A is the inlet and B the outlet; C is a $\frac{1}{4}$ -in. pipe through

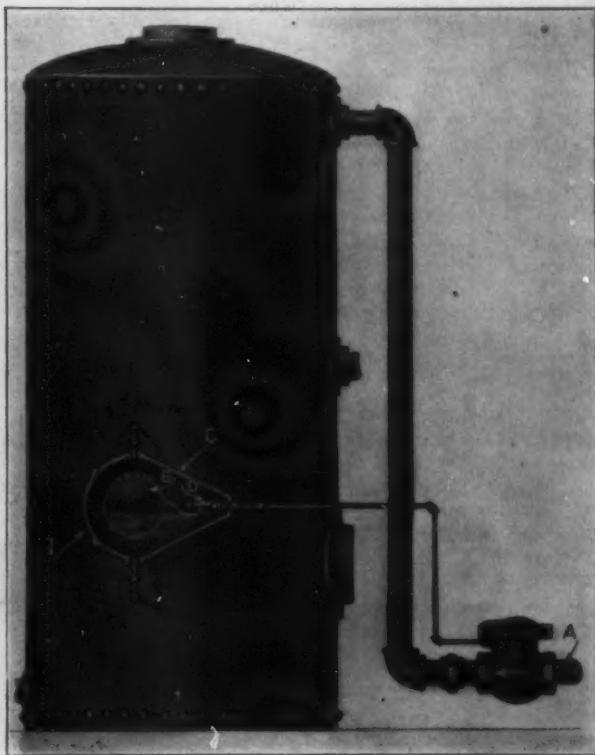


Fig. 2.—The Hydromatic Valve Applied to an Open Feed Water Heater to Control the Water Level.

which water passes from the head chamber above the plunger to the tank when water has been drawn from the latter. Vent holes in the plunger top are located at D, and a lead or rubber gasket at E makes a tight joint between the plunger and its seat. When the valve is installed in conjunction with an open feed water heater, as illustrated in Fig. 2, the water enters through the supply pipe A, and after passing through the valve enters the feed water heater through the large pipe. As the copper float B is lowered by the withdrawal of water from the tank or feed water heater, the pilot valve D is opened. This causes water to flow from the head chamber above the valve plunger through the $\frac{1}{4}$ -in. pipe C, Fig. 1, and relieves the pressure on the upper part of the plunger enough to enable the pressure of the water entering the inlet A to force the plunger up. The flow of water through the valve into the tank then starts, and when the water level is re-established the pilot valve D, Fig. 2, closes. The pressure above the plunger is then built up through the vent holes D, Fig. 1, in the plunger top and the plunger is forced down against the gasket E and the flow of water through the valve shut off.

The valve body is of cast iron and has a removable cover plate of the same material. The brass plunger is made in two parts and the lower portion is threaded to screw into the upper one at E, Fig. 1. The top of the plunger is piston-fitted into a brass bushing. A 5-in. seamless Hercules copper float, B, Fig. 2, is used in all sizes of valves, and is set at the height of the required water level inside the tank or in a casing C, Fig. 2, on the outside. When mounted in this way the float casing is connected through the heater by a $1\frac{1}{2}$ -in. pipe below and a $\frac{1}{2}$ -in. pipe above. The valve is connected in the supply pipe at any distance either above or below the float.

about 120 ft. to the pipe about the lavatory wing and the dust then has a direct drop of about 70 ft. to the dust house. The dust from the farthest machine has a total distance of probably 475 ft. to travel before it comes to rest in the dust house.

The installation is one made by Kirk & Blum, Cincinnati, Ohio. The system, it is emphasized, has given entire satisfaction and it is claimed that the relay system of fans brings the fan closer to the work by ridding the system of the air as early as is convenient and by eliminating friction in long lines of pipe, as compared with the central fan idea. That about 25 per cent. in power requirements is saved is the experience, and satisfactory control of the suction at the machines has been found possible.

Steel Stack for 10,800-hp. Boiler Plant

The James McNeil & Bro. Company, Pittsburgh, has just completed a riveted steel stack which is probably the largest, though not the highest, of its kind in the world. The stack was built in Pittsburgh at the company's works on Twenty-ninth street and was erected by the company in Cleveland at the foot of East Seventieth street for the new power house of The Cleveland Electric Illuminating Company, and it will supply draft to eighteen 600-hp. boilers. The bottom diameter is 40 ft. and the diameter at the top is 22 ft. It is supported by heavy structural columns firmly anchored in a concrete foundation and an idea of the structural work is gained in the accompanying cut. The height of the stack including the structural supports is 275 ft. The weight of material used for stack only, not including supports, was about 400,000 lb. and it required the driving of about 30,000 rivets. The erection of this stack during the winter season was accompanied with difficulties, owing to its position on the lake front, being exposed and subject to high winds.



Lake Superior Iron Mining Veterans

MARQUETTE, MICH., May 13.—Captain John McEncroe has resigned the position of underground superintendent of the Oliver Iron Mining Company's hard ore properties at Ishpeming, Marquette range, after more than fifty-three years of continuous service. He will retire on a pension. Captain McEncroe has the distinction of having been in the employ of one mining company much longer than any other man in the Lake Superior region. A singular feature about his record is the fact that he has been employed continuously at one mine, serving successively in the capacity of miner, captain and underground superintendent.

Another Lake Superior mining veteran who has retired from active work is Capt. James F. Foley, of Negaunee. Captain Foley is 80 years of age. He has been engaged in mining in Upper Michigan since 1850, a period of sixty-one years, although not at one property. He has had service both in the copper and iron districts and for many years past has been in charge of the Negaunee properties of the Breitung interests of Marquette. He has been pensioned at his full annual salary.

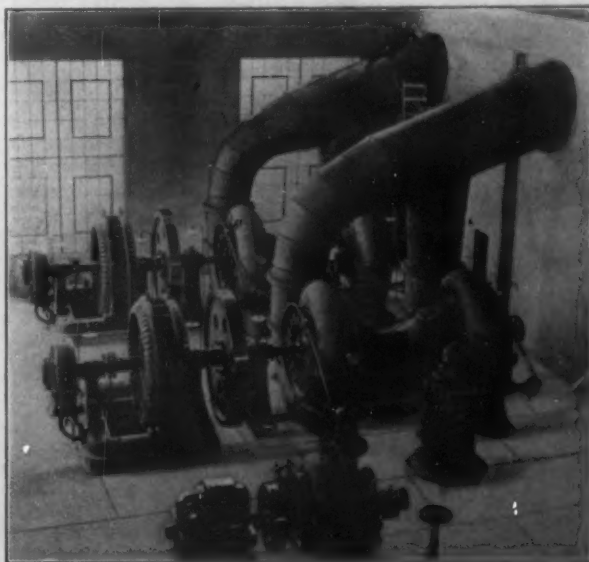
The Under-Feed Stoker Company of America has removed its general offices to the Harris Trust Building, Monroe street, between Clark and La Salle streets, Chicago.

Notable Installation of Pelton-Francis Water-Wheels.

One of the most modern hydroelectric power plants in this country was recently completed for the Consumers' Power Company, Mankato, Minn., on the Blue Earth River, nine miles southwest of the city of Mankato. An interesting feature of the plant was the installation of twin central discharge Pelton-Francis turbines, a type of water wheel not often used in hydroelectric power plant construction. The power plant is planned so that it can be extended to develop 3500 hp., of which 2320 hp. is now installed and in operation.

In developing the needed amount of water fall some rather difficult problems were overcome. The site chosen was formerly a rapids and falls in the Blue Earth River and it was found necessary to build a dam of hollow reinforced concrete, which is surmounted by a 16-ft. roadway. This dam impounds water for approximately six miles along the river valley, creating a pond surface of something over 500 acres. In order to make way for the pond a county bridge near the dam, which would have been submerged, was removed and the power company built a roadway over its dam to take the place of the bridge, while the latter structure was moved four miles up stream, thus increasing the traffic facilities across the river in that neighborhood.

The dam spillway is 272 ft. long and has fifteen bays marked by 24-in. concrete buttresses. These buttresses support a wall sloping up stream 45 degrees over which the water passes. There are seven 32-ft. water gates operated from hand wheel shafts and chain drums. The power house structure forms part of the dam bulkhead and it is a concrete building 38 x 73 ft. in plan and 30 ft. high. Two 1160-hp. water wheel driven generator sets and one water wheel driven exciter set now occupy the building, and later another alternator set and one exciter set will be added.



Pelton-Francis Turbines, Consumers Power Company, Mankato, Minn.

Each of the two main alternator units now in the power house consist of a twin pair of horizontal 32-in. spiral case Pelton-Francis water turbines made by the Pelton Water Wheel Company, San Francisco and New York, direct connected to drive a 750-kw. 2300-volt, 60-cycle three-phase General Electric generator at 300 r.p.m. Individual 16-kw. direct current exciter units are mounted on extensions of the main shafts of these machines. A 12,000-lb. flywheel is mounted between the water wheels and the main generator of each unit to assist regulation of the machines. The units are controlled by Pelton oil pressure governors operating rocker arms which manipulate the gates of the twin water wheels simultaneously. The water wheels discharge into steel draft tubes 16 ft. in length. The water wheels are contained in cast iron cases and have bronze runners and outside regulating mechanism.

S. DIESCHER & SONS.
Mechanical and Civil Engineers,
PITTSBURGH, PA.

The Ventura Disk Fan

A new curved disk blade fan, to which the trade name Ventura has been given, is a recent product of the American Blower Company, Detroit, Mich. The ventilating appliance is the result of a series of experiments covering

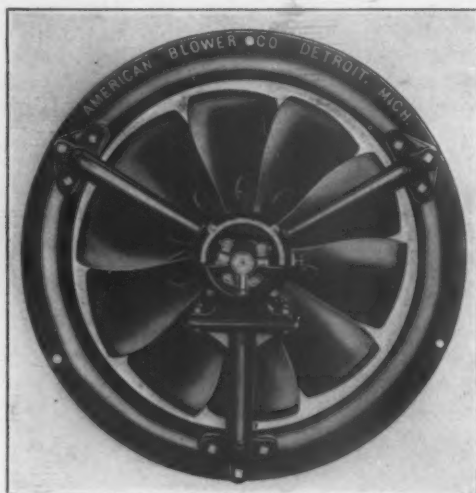


Fig. 1.—The Ventura Disk Fan. Made by the American Blower Company, Detroit, Mich.

four years and in its construction all the good features which a fan of this character should possess have been retained while a number of new ones have been added. Among the special points upon which emphasis should be laid are an exceptionally high mechanical efficiency, ability to overcome resistance, a speed as high if not higher than other fans of the disk type and the throwing of the current of air straight ahead as it leaves the fan. Fig. 1 is a view of the fan and Fig. 2 shows the efficiency of the new fan as compared with two of the propeller type which were formerly used.

As will be noticed from Fig. 1, the fan consists of ten broad blades having a dip or curve to produce large volumes of air freely or against pressure with low power consumption and application has been made for patents covering the constructional features. As the air leaves the fan it tends to bend inward for a considerable distance, a feature which is claimed to be contrary to the action of any other disk fan on the market. With one of

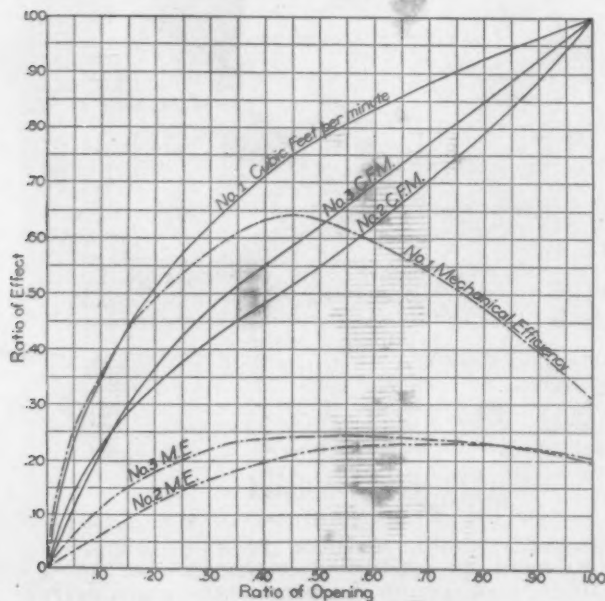


Fig. 2.—Chart Showing the Efficiency of the Ventura Fan as Compared with Two Standard Disk Fans.

these fans it is said to be possible to set it 16 in. away from a hole in a box and discharge more air on the farther side of the opening than is handled by the fan itself as a result of the siphonic action of the air drawing in more along the face of the box as it passes through the opening.

The mechanical efficiency and capacity of the Ventura fan as compared with two others of the propeller type is shown in Fig. 2. The curves were plotted from the results of tests made under exactly similar conditions. The curves marked No. 1 are for the Ventura fan while those marked No. 2 and No. 3 are the two competing ones. One of the special points to which attention should be called in this connection is the high mechanical efficiency of the Ventura fan which has a maximum value of 64 per cent. while the highest efficiencies with the other two were 24.5 and 23 per cent. respectively.

The Buffalo Feed Water Strainer

For a number of years the Buffalo Forge Company, Buffalo, N. Y., has used a strainer in connection with its air washing apparatus. As a result of the very good service given by it, the device has been placed on the market by the company for removing foreign matter from feed water and water supply and similar systems.

This strainer differs from the customary styles which have been developed along the automatic and semi-auto-



An Improved Type of Feed Water Strainer, Made by the Buffalo Forge Company, Buffalo, N. Y.

matic lines involving a more or less complicated design. The special feature of the Buffalo strainer is its simplicity and it consists of only four parts, the body, the top, the basket and the clamp. The basket, which is the vital part, is made of fine mesh brass screen soldered into a brass former or top piece and reinforced by strong brass strips and bands running in both horizontal and vertical directions. To decrease the resistance offered to the passage of the water the strainer has been made exceptionally large and the minimum area is 15 times that of the connecting pipe, an arrangement which not only increases the effectiveness of the device but also lengthens the time that it can be used without cleaning. When it becomes necessary to clean the strainer, the clamping bolts holding the cover in place are loosened and the cover removed. The basket can then be taken out and held under a faucet until thoroughly cleaned, the whole operation requiring about 2 min. If the strainer is installed in a location where continuous operation is required, a by-pass which may or may not be equipped with a strainer is used.

The Mumford Molding Machine Company, Plainfield, N. J., reports a rapid increase of business. In addition to a large number of its jolt rammers shipped mainly on single orders to separate shops, the following orders have been received within the last few days: One 32-in. jolt rammer, with table 6 ft. x 9 ft., for the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala.; one 20-in. and one 16 in. for the Pennsylvania Steel Company, Steelton, Pa.; one 16-in. and one 14-in. jolt rammer, among other machines, for the Treadwell Engineering Company, Easton, Pa. Within the few days since Judge Holland dismissed the bills in the suits of the Tabor Mfg. Company against the Mumford interests, business in small vibrator machines has been exceptionally good.

L. P. Brodeur, Dominion Minister of Marine and Fisheries, says that the contract for the dry dock at Montreal has been awarded to Vickers Sons & Maxim. The Dominion government will pay a subsidy of 3½ per cent. per annum and capital outlay of \$3,000,000 for a period of 38 years. The dry dock will have a lifting capacity of 25,000 tons.

The Machinery Markets

A better machinery demand has developed in the Middle West. A decided improvement is noted in Chicago where machine tool lists issued by the government for the Rock Island Arsenal and the Reclamation Service will shortly be closed. The western railroads are closing out against inquiries previously sent out and are preparing new machinery lists. In Detroit the automobile manufacturers are steadily placing orders and the demand from other sources is sufficient to make business generally good. New inquiries and foreign orders are plentiful in Cleveland and a good business is being done by makers of metal working machinery other than machine tools. The automobile demand in the Cleveland market has increased materially. Trade is somewhat slower in Cincinnati, but there is an improved call for radial drills and dynamos. The Ralston Steel Car Company is buying against a small list in that market. General improvement is shown in Texas, notwithstanding the fact that the Mexican trouble is holding up business which was expected to develop from the mining centers. Trade is more quiet in the South, although the demand for cold storage plant equipment has improved. Good orders were placed during the week in New York, but new inquiries are scarce. There is not enough business to go round in Philadelphia and the outlook there is not very encouraging.

New York

NEW YORK, May 17, 1911.

Large orders have been placed by the Ontario & Western Railroad against the extensive list it issued several months ago. It is estimated that the company bought fully \$50,000 worth of equipment. The placing of the orders so soon after receiving additional bids on much of the equipment the company had been inquiring for came as something of a surprise, as many machinery men who had been asked to submit new bids two weeks ago were not expecting to see the business closed so soon. The Pennsylvania General Electric Company was also a generous purchaser during the week. The company bought machinery for delivery to the large plant at Erie, Pa., and it will be installed in a machine shop now operated in connection with the foundry there. The same company is planning for further extensions at Erie, which includes a machine shop of a size not yet decided upon. In addition to these large orders New York machinery houses booked an encouraging amount of business from day to day, but while current business is good the outlook is not so encouraging. New inquiries are scarce and there is not much in sight in the way of factory extensions and new enterprises. New York machinery men are watching the Canadian Car & Foundry Company in the expectation of getting some good orders from there soon, as a few weeks ago the Amherst plant of this company, including its forge shops and machine shops, were destroyed by fire. Much of the equipment in this plant was sold by New York houses and it is stated that it will have to be replaced. Export trade continues especially good and some large orders for machine tools have been booked of late for delivery in England and Germany. German manufacturers of railroad equipment, including locomotive and car builders, are buying rather extensively and two Japanese engineering houses will shortly purchase machine tools. The war in Mexico is affecting the mining trade rather seriously, as some good business that was expected from Mexican mining companies has not materialized.

The citizens of Rockville Center, Long Island, N. Y., have decided to hold a special election for the purpose of voting an appropriation of \$17,000 for the erection of a new power house to be operated in connection with the public lighting plant. Plans for the power house include the installation of two 800-hp. boilers and a coal conveying plant.

The Hatfield Rail Joint Mfg. Company, 11 Broadway, New York, has been incorporated with \$500,000 capital stock under the laws of the State of Delaware to manufacture a patented device for the continuous joining of railway rails. For the present the company will have its product manufactured by contract with a view to establishing a factory in the near future. The officers of the company are: President, F. B. Stubbs; vice-president, J. F. Scott.

A portion of the iron working plant of Theodore Smith, Hudson and Essex streets, Jersey City, N. J., was recently destroyed by fire, causing a loss of \$30,000. Most of the damage was to patterns and machinery in the upper floors of the main building and plans are under way for the rebuilding and replacement of the burned portion and equipment.

The Wilson Case Company has been incorporated at Gloversville, N. Y., with a capital stock of \$50,000 to manufacture articles of leather. The incorporators are W. J. Wilson, F. J. Fisher and T. H. Bartlett.

The Wood & Brooks Company, Buffalo, N. Y., manufacturers of piano keys and keyboards, is building

a five-story concrete addition, 56 x 230 ft., with a seven-story tower, at its plant on Military Road, Kenmore avenue and the New York Central Railroad, North Buffalo. The Turner Construction Company, New York and Buffalo, has the contract for erection.

The Hutchins-Kilbourne Company has been incorporated at Buffalo with a capital stock of \$50,000 and will establish a plant in that city for the manufacture of wire and hardware specialties. The incorporators are W. W. Lytle, O. J. Manchester and J. J. Price.

The American Agricultural Chemical Company is building at its Buffalo plant at Babcock and Lyman streets and the Erie Railroad a large storage warehouse and a power house to cost about \$50,000.

The F. N. Burt Company, Ltd., Buffalo, is building a large power house to operate its extensive plant at Seneca, Hamburg and Myrtle streets for the manufacture of paper boxes. The power house will cost \$25,000.

The Frontier Iron Works, Buffalo, will at once commence the construction of a two-story brick addition to its plant at Letchworth and Grant streets and the New York Central Railroad.

The plant of the Crandall Packing Company, Palmyra, N. Y., was totally destroyed by fire on May 9. Plans for the rebuilding and equipment of the plant are being taken.

The Manning & Peckham Paper Company, Troy, N. Y., has let contract for the construction of a two-story paper mill 87 x 106 ft. which it will build at the foot of Cypress street.

The Buffalo Standard Mfg. Company has been incorporated at Buffalo to manufacture hardware specialties and has established its factory at 77 Washington street. The directors are Thos. C. Amsden, Charles Slosberg and William Herman.

The village of Mexico, N. Y., is having plans prepared by W. G. Stone, engineer, Mann Building, Utica, N. Y., for water works to be constructed at once at an estimated cost of \$50,000.

The Johnston Harvester Company, Batavia, N. Y., in addition to the two foundry buildings, each 70 x 500 ft., two stories, of reinforced concrete, now under construction, will erect a four-story structure 80 x 500 ft. to afford increased manufacturing facilities for other departments.

The Sherwood Shoe Factory, Rochester, N. Y., has completed plans for a five-story addition 50 x 100 ft. to be made to its factory on South Goodman street.

Catalogues Wanted

The Oxy-Acetylene Appliance Company, 149 Broadway, New York, will soon be in the market for machinery and desires catalogues of manufacturers of machinery, tools, etc.

New England

BOSTON, MASS., May 16, 1911.

No change for the better or the worse is apparent in the machinery market. Occasionally one finds a builder of machinery or of appurtenances of machinery who is fairly busy. The chuck manufacturers, for example, seem to be faring better than most of those who provide machine shop equipment. Dullness is the rule, however. The textile machinery builders find conditions very bad. The bottom appears to have dropped out of the textile market for some reason, and naturally the manufacturers of equipment for the industry are suffering in consequence. Most of these shops are running on short time with reduced working forces.

The Baird Machine Company, Oakville, Conn., has

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completed plans for the new plant which will be erected in a suburb of Bridgeport, Conn., and the contracts will be let immediately. The works will consist of a two-story office building, a one-story machine shop, with gallery, a power house, pattern shop and storehouse.

The Rollins Engine Company, Nashua, N. H., builders of steam engines, is considering the installation of a new power plant at its own works later in the summer.

In regard to the purchase of the business of George G. Prentice & Co., Inc., New Haven, Conn., by the New Britain Machine Company, New Britain, Conn., mentioned last week, the transaction includes all the patents on the Prentice automatic turret lathe, which have been extensively adopted for manufacturing operations, involving boring, threading, facing and milling. The machine is built in all sizes and styles. The extensive work of development which G. G. Prentice has undertaken in connection with the machine in the last 10 years has been very arduous, and he finds himself in need of relief from business cares. It is his plan to spend some time abroad in search of health. The New Britain Company proposes to operate the New Haven plant for a time, until the business can be taken care of in new works. Land adjoining the factory on Chestnut street, New Britain, has been purchased, giving a frontage of over 600 ft. on that thoroughfare. The present works will be extended by a building 58 x 128 ft., five stories. This plan permits the serving of the first floor by a crane, taking from cars at one end and delivering anywhere in the 400 ft. of the building.

Edward Blake, Jr., formerly manager of sales for the Wells Bros. Company, Greenfield, Mass., and recently manager of the Canadian Tap & Die Company, Ltd., Galt, Ontario, has been made general manager of the J. T. Slocomb Company, Providence, R. I., manufacturer of machinists' tools. He has had a most successful business career and leaves the Canadian field only because of the opportunity offered by the line of the J. T. Slocomb Company. The company was the pioneer in the large micrometer and combination center drill, which lines have been widely amplified.

The large addition which will be built on one of the buildings of the Lynn Works of the General Electric Company will be devoted to storage.

The machine tool business of the late George W. Fifield, Lowell, Mass., is for sale, including the building and machinery.

The Mead-Morrison Mfg. Company, Cambridge, Mass., manufacturer of coal handling and hoisting machinery, has plans in hand for increasing its works, but will be held in abeyance for the present. The company finds business fair, but not quite normal.

The Bantam Anti-Friction Company, Bantam, Conn., is planning to extend its factory this season.

The F. E. Wells & Son Company, Greenfield, Mass., manufacturer of machine tools and pipe tools, is planning the erection of a factory which will be used by the E. F. Reece Company, which was consolidated in the business a few months ago.

The works of G. W. Bradley's Sons, Inc., Westport, Conn., manufacturer of axes and edge tools, has been destroyed by fire, with a loss of \$50,000. The company states that it plans to resume the manufacture of its line but whether the factory will be built at Westport or elsewhere has not been definitely decided. Several cities and towns are bidding for the business.

R. M. Clough, Tolland, Conn., has brought out a new vertical bench milling and drilling machine, with a capacity to drill 1/2-in. holes or smaller, and for mills 1/2 in. or smaller with heavy cut and larger sizes for light cuts.

The business of the Connecticut Brass Company, West Cheshire, Conn., has been incorporated as the Connecticut Brass Company, Inc., with a Connecticut charter, and a paid in cash capital stock of \$100,000. Michael Keeley is the president, Michael E. Keeley, vice-president and treasurer, and George J. Lines, secretary. The management and ownership remain unchanged. The company manufactures sheet brass, german silver, etc. The plant has grown rapidly under the ownership of M. E. Keeley, the capacity being now about twice what it was before he assumed the management.

The National Pipe Bending Company, New Haven, Conn., has let the contract for a fireproof addition to its works, which will be used for a setting up shop. The company has just added to its line a new direct contact open type feed water heater in which an oil separator is embodied.

The new plant of the Royal Typewriter Company, Hartford, Conn., mentioned last week, will be 50 x 310 ft., four stories. Between 10 and 15 motors of from 5 to 35 hp. will be required. The sprinkler system will be installed by the owners. The electric pumping plant will have as an auxiliary a concrete tank of 112,000 gal. capacity.

The Standard Mfg. Company, Bridgeport, Conn., manufacturer of automatic gear cutters, automatic slotting machines and electrical specialties, will probably erect an additional factory building this summer, which will double the present floor space. This will be in addition to a building, now in course of construction, 20 x 62 ft., three stories, which will be used for receiving and shipping, stock room and office. The company has more orders on its books than at any time in its history and the outlook indicates the need of more manufacturing capacity. The business was established only six years ago by Clarence E. Bilton, the president and treasurer, and has grown very rapidly.

The Artistic Bronze Company, South Norwalk, Conn., is to move to Bridgeport, Conn., where it will occupy a large factory building.

Additions to general manufacturing plants of New England include the following: Houlton Woolen Mills Company, Houlton, Me., addition, to double present capacity; Union Packing & Refrigerating Company, Montvale, Woburn, Mass., large plant at Portland, Me.; Kroger Piano Company, Stamford, Conn., four-story addition 160 ft. in length; American Paper Goods Company, New Britain, Conn., additional story on buildings 65 x 75 ft. and 65 x 90 ft.; Thames Dye & Bleaching Company, Montville, Conn., concrete addition 40 x 55 ft., three stories.

The Chapman Valve Mfg. Company, Springfield, Mass., has carried through its plan of financial reorganization. A new corporation has been organized under the same name, with the exception that a "the" has been introduced before the corporation title. The nominal capital stock is reduced from \$1,300,000 to \$1,000,000, but the actual cash capital is \$200,000 greater. Of the shares \$500,000 are 7 per cent. cumulative preferred and an equal amount common stock. The incorporators are members of the old board, namely, Adolph W. Gilbert, Edwin A. Carter, George B. Holbrook, Dwight O. Gilmore and William C. Godfrey.

The International Silver Company, Meriden, Conn., will build an addition to its factory to be 58 x 122 ft., four stories.

Philadelphia

PHILADELPHIA, PA., May 17, 1911.

The general demand for machinery and tools shows no material betterment. A few requirements of moderate size are still under negotiation, but orders develop very slowly. New business in this territory continues quiet, the day to day demand for ordinary equipment showing little improvement. Merchants pick up a few odd orders for various tools, but there has not been enough business offered to go around, as a result of which the market continues to show an irregular appearance. In many instances sales are confined to small individual tool propositions. There is still an absence of buying on the part of the railroads centering in this district, although a little better movement among some of the Southern and Western roads is reported. Manufacturers of both special tools and those of the usual standard types are not so actively engaged, new business coming in being on a somewhat smaller scale. Builders of heavy engines report a slowing down in the demand, but continue fairly busy on orders already on hand. Transactions in second hand machinery and tools has been irregular. While there is a moderate amount of small business in sight, the outlook for any marked improvement in the machine tool business is not considered particularly promising. With continued inactivity on the part of machine tool builders, the volume of business coming to manufacturers of both gray iron and steel machinery castings is light and few are engaged at anything like normal capacity.

The Treadwell Engineering Company, Easton, Pa., will be prepared to begin operations in its gray iron foundry before June 1. The foundry will have a daily capacity of 100 tons, served by two cupolas, one of 14 and the other of 8 tons hourly melting capacity.

The Standard Dental Mfg. Company, Twenty-sixth and Oxford streets, has awarded a contract to the Philip Haibach Construction Company for the erection of a factory building of the slow burning mill construc-

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tion type, 37 x 136 ft., two stories, for the general manufacture of dental supplies. Furnaces for burning purposes and some machinery of the lighter type are to be installed. Electricity will be used for power purposes. The new plant will enable the company to double its present capacity.

H. B. Pancoast & Co., 243 South Third street, are taking estimates for the erection of a warehouse and storage building to be built at Front and Ellen streets. The plans call for a building 54 x 160 ft., three and two stories, which will be used for the storage of wrought iron pipe, fittings and general supplies. A railroad siding from the Philadelphia & Reading Railroad will extend into the warehouse.

The Baldwin Locomotive Company has purchased an additional tract of 30 acres of land adjoining its present plant at Eddystone, Pa. The purchase has not been made, we are advised, with a view of any immediate improvement in the plant, but largely for the purpose of control and for possible future use. This concern reports business conditions unchanged. Orders are light, but negotiations are pending, among others, against an inquiry for 20 engines for export.

The Sweet Steel Company, Williamsport, Pa., is tearing out its old 9 and 14 in. rolling mills and will install new mills of the same size, driven tandem, for re-rolling rails. A new Corliss engine is being installed to drive these mills.

The Reading Foundry & Supply Company has recently been formed under the laws of the State of Delaware with a capital stock of \$50,000 and has taken over the business of the McCambridge Cooper Company, Seventh and Chestnut streets, Reading, Pa., manufacturing and conducting a general foundry and plumbing supply business. The officers of the company are John G. Fleck, president; James McC. Chase, vice president, and S. W. Fleck, secretary and treasurer.

A contract has been placed, it is reported, with H. E. Baton, for the erection of a two-story factory building and the rebuilding the power house and the main portion of the plant of Gordon Brothers, manufacturers of curled hair, etc., at Pierce and Orthodox streets, Frankford, which was damaged by fire some time ago. Particulars regarding requirements in the way of power equipment are not available at this time.

Harris & Richards, architects and engineers, are engaged on plans for a building known as No. 14, for the new plant under erection for the General Electric Company at Erie, Pa. This building will be of brick and reinforced concrete, 75 x 400 ft., five stories, and will be designed, to a considerable extent, for pattern storage purposes.

Information regarding the equipment required by the Organic Chemical Company for its new plant at Fort Washington, Pa., will be available at an early date. Dr. S. Lewis Summers, Fort Washington, Pa., will have charge of purchases.

The Adams & Westlake Company, manufacturer of railroad and ship hardware and supplies, has purchased property at Twenty-second and Ontario streets, extending through to Bellevue street, on which it will erect a new plant. Plans are now in preparations by M. Ward Easby, engineer, but little of a definite nature in connection with the new plant has yet been decided upon.

The Keystone Type Foundry Company has purchased a tract of land in Chester, Pa., and a contract for the erection of a manufacturing building, 60 x 240 ft., three stories, is about to be placed. The plant is to be located in the vicinity of Fourth and Engle streets.

Contracts for bridge work were awarded recently for improvement to city bridges, previously reported in this report. M. & J. B. McHugh have the contract for widening Chestnut street bridge, while that for the bridge on the line of Springfield avenue and the Baltimore Central Branch of the Pennsylvania Railroad was awarded to Donato Delise.

Cincinnati

CINCINNATI, OHIO, May 16, 1911.

If there is any change at all in the machine tool situation it is probably a trifle slower. The demand for lathes is lighter, but radial drills show some improvement over the previous week. Second-hand equipment is holding up fairly well, and there is yet no falling off in the number of inquiries and orders for small electrical dynamos and motors.

The Ralston Steel Car Company, Columbus, Ohio, is inquiring in this market for prices on the following machinery:

One Plate shear, motor driven, to shear 84½ x ½ in. plates. Equipped with counterweights.

Two heavy axle lathes, to turn 5½ x 10 in. axles. To be motor driven.

Two car wheel borers, 42 in., of sufficient capacity to bore steel wheels for 100,000-lb. capacity trucks; motor driven.

One wheel press of 200 tons capacity, latest type and design; motor driven.

Two heavy punching machines of sufficient capacity to punch 20 13-16 in. holes through ¾ in. plate at least 54 in. between centers of outside holes. Motor driven.

Two heavy punching machines, 48 or 60 in. throat, arranged for single punching and to have attachments for punching holes up to 20 in. in diameter through ¾ in. plates. Also to have shearing capacity to cut 12 x 2 in. flats. Motor driven.

All of these machines are to be equipped with Westinghouse motors. Later the company will purchase a hydraulic press from 800 to 1000 tons capacity, with a bed 10 or 12 x 16 ft., press to be arranged for 1500 lb. water pressure. A drop hammer of sufficient size to handle arch bars and light material for car work will also probably be required.

A large amount of structural material will be necessary for building the proposed Cincinnati General Hospital, work on which is expected to begin soon. The Westlake Construction Company, St. Louis, was the lowest bidder at the opening last week, submitting a figure of \$1,544,135 for the entire work, but contract has not yet been formally awarded.

Merely for the purpose of preserving its name the Cincinnati Machine Tool Company, now a part of the Cincinnati Bickford Tool Company, has been incorporated with a nominal capital stock of \$1,000. A. H. Teuchter, S. C. Senauer, W. H. Shafer, C. C. Stele and C. P. Gradolf are named as the incorporators.

John Kirby, Jr., president of the National Association of Manufacturers, was host at a banquet given at the Dayton Club, Dayton, Ohio, on the evening of May 11, in honor of Gen. Harrison Gray Otis, of Los Angeles, Cal. General Otis was en route to the annual meeting of the association.

The Cincinnati Business Men's Club, whose quarters were destroyed in the recent Chamber of Commerce fire, has leased the Phoenix Club Building at Ninth and Race streets, and will move from its temporary quarters in the Grand Hotel some time in July.

Rapp, Zettel & Rapp, Cincinnati, are architects in charge of plans for an addition to the plant of the R. Wurlitzer Company at Tonawanda, N. Y. The main building will be 60 x 300 ft., three stories, and of concrete construction. There will also be two large dry kilns and a storekeeper's building.

The Foote-Rolaff Machinery Company, San Antonio, Texas, is asking in this market for prices on the following machine tools: One 42 x 42 in. planer; one 36 in. x 9 ft. bed lathe; one 24 in. sliding head drill press; one 16 or 18 in. shaper; one 36 in. radial drill and one power hack saw. It is understood that second-hand tools are wanted.

The Corcoran Lamp Company, Cincinnati, has had plans for its factory building revised. The new structure will be 72 x 92 ft., four stories.

The Chamber of Commerce, Hamilton, Ohio, announces that arrangements have been about concluded with an outside firm for establishing a factory in Hamilton to manufacture roller bearings.

The Cincinnati Reduction Company, Cincinnati, has taken out a permit to erect a small ice factory at Anderson's Ferry.

The Alvey-Ferguson Company is a new Ohio incorporation with \$300,000 capital stock. The incorporators are Morris U. and E. P. Bernheim, J. B. Frenkie, Albert Seasongood and Louis T. Fecheimer. Mention was recently made of the company's intention to move its plant from Louisville, Ky., to Oakley, Cincinnati, Ohio.

Cleveland

CLEVELAND, OHIO, May 16, 1911.

While conditions in the local machine tool market remain nearly stationary, the little change that has occurred from week to week recently has been for the better. The past week there was a fairly good inquiry for single tools and a few inquiries came out for several small tools. Builders of automatic screw machinery and turret lathes report quite a gratifying increase in the volume of their foreign orders. Manufacturers in most metal working lines outside of machine tools report a fair volume of business. In the automobile trade conditions appear to have improved materially during the past few weeks. Many of the automobile manufacturers who restricted their output very mate-

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rially early in the year are now compelled to crowd their plants to keep up on orders. In Akron, which is the center of the rubber tire making industry, the tire making plants are very busy and their activity is reflected among the allied metal working industries in that city. Business is generally good with local manufacturers of automobile parts and specialties.

The Booth Demountable Rim Company, Cleveland, is considering the removal of its plant to Detroit, Mich. If the change in site is decided upon a new plant will be built. In case the company remains in Cleveland its present plant will be enlarged considerably. In either event the company will buy considerable new machinery, mostly presses. The company has just increased its capital stock from \$100,000 to \$200,000.

The Wise Furnace Company, Akron, Ohio, which recently purchased a site for a new plant, is having plans prepared for a foundry, on which work will be started during the summer. The erection of the remainder of the plant will be deferred until next year.

The Knight Tire & Rubber Company, Canton, Ohio, is being organized to build a plant for the manufacture of solid and pneumatic tires, the erection of which will be started about June 1. The plant will be two stories, of brick construction, 50 x 250 ft. The company will be incorporated with a capital stock of \$300,000 by G. F. Knight, C. H. Knight, W. S. Cunningham, H. C. Evans and M. J. Shea.

The Biggs Boiler Company, Akron, Ohio, will enlarge its plant by the erection of a boiler shop, machine shop and power plant. The new building will be 120 x 225 ft., of brick construction. It will be equipped with electric traveling cranes.

The Auto Appliance Mfg. Company, Akron, Ohio, has been organized with a capital stock of \$50,000 to build a plant for the manufacture of an automatic starting device and other automobile accessories. The plant will be located on West Buchtel avenue. Andrew Auble is the president.

The Acme Specialty Mfg. Company, Toledo, Ohio, has been incorporated with a capital stock of \$25,000 to manufacture metal specialties and water heaters. The incorporators are A. Schlett, C. J. Schneider, Karl A. Flickinger and others.

The Lundgren Aeroplane Company, Youngstown, Ohio, has been incorporated with a capital stock of \$10,000 by L. Lungren, H. C. Dunn and others. It is stated that the company will build a plant for the manufacture of aeroplanes.

The Bucyrus Steel Casting Company, Bucyrus, Ohio, has increased its capital stock from \$200,000 to \$400,000.

The Phelps Tin Can Company, Baltimore, Md., is erecting a large tin can plant at Wierton, near Steubenville. The machinery will be driven by individual motors.

The Johnson Coin Lock Company, Columbus, Ohio, has been incorporated with a capital stock of \$25,000 to manufacture lock specialties. The incorporators are S. M. Comby, H. Milles, W. M. Huffman, M. R. Thornton and Barton Griffith.

It is announced from Warren, Ohio, that the Ohio Universal Motor Truck Company will build a plant in that city. The local Board of Trade will furnish a site.

The Elyria Foundry Company, Elyria, Ohio, has increased its capital stock from \$25,000 to \$50,000.

Scattering inquiries of all kinds are appearing and have done much to eliminate the depression that so marked this market a few weeks ago. Dull business, coupled with labor troubles in some of the principal furniture manufacturing cities of the country, is having its effect upon wood-working machinery.

The Wheeling Corrugating Company, Chicago, Ill., has leased the property located at the southwest corner of Campbell avenue and Harvard street, 134 x 627 ft., for a term of 99 years, upon which it will erect a warehouse at a cost of between \$50,000 and \$75,000.

The Chamber of Commerce of Springfield, Ill., is negotiating with an Indiana firm engaged in the manufacture of drainage tile and sewer pipe for the removal of its plant to Springfield.

It is reported the Holbrook-Armstrong Iron Company, Racine, Wis., is preparing to manufacture a line of gasoline engines. The company recently increased its capital stock from \$100,000 to \$300,000.

The Fairview Milling Company, Fairview, S. D., has had surveys made with a view to constructing a hydro-electric plant on the Big Sioux River at Fairview at an estimated cost of about \$116,000.

Bonds in the sum of \$14,000 have been voted by Bradley, S. D., for the installation of a water works system.

Detroit

DETROIT, MICH., May 15, 1911.

A very satisfactory week has been the general reply to trade questions. The automobile people have received a steady volume of orders as well as the accessory lines. Shipments have been large and will continue so for at least this month, based on the orders placed ahead. Two important building permits were taken out this week, both large structures in the downtown district, requiring considerable structural steel work.

The Brunswick-Balke-Collender Company, manufacturer of billiard and pool tables, suffered a disastrous fire the past week. Practically nothing was saved. The company is well insured.

The Detroit Auto Dash Company filed articles of incorporation with the Secretary of State this week. The company will start with a capital stock of about \$15,000, and has with it Stephen B. Miller and Herbert C. Whitney, who hold the majority of the stock.

The Kelsey Herbert Company has increased its capital stock from \$100,000 to \$200,000 with the purpose of increasing the capacity of the plant. The added capital will be placed as preferred stock.

A new iron industry is the Detroit Metal Drawing & Rolling Company, organized this week, with a capital stock of \$10,000. No new building will be erected at present but factory structures will be leased. Hugo Newman and Charles Klein the principal stockholders.

A company of considerable importance is the new Metal Shingle Company, incorporated this week with the Secretary of State. The company has a capital stock of \$20,000 and is well supported by local capital. The control of the stock is held by Cyrus Dolph.

The Wentworth Mfg. Company, metal worker, filed articles of association this week with a capital stock of \$10,000. No new structures will be built at present, the main expenditures being for equipment. Eugene H. Wentworth is the organizer.

The Continental Motor Car Company, at present located at Muskegon, Mich., has at least decided on its future location. The company will build in this city a large and important structure adjoining the plant of the Hudson Motor Car Company. The building will give 200,000 sq. ft. of floor space and will be equipped throughout, the plant at Muskegon being operated in conjunction with the plant in this city.

For the purpose of expansion and improvements the McKinnon Boiler & Machine Works, Bay City, Mich., has raised its capital stock from \$50,000 to \$100,000.

The Holland Furnace Company, Holland, Mich., is planning to increase the capacity of its plant this summer by an addition 50 x 80 ft. It turns out nine furnaces daily.

The Detroit Steel Castings Company of this city held its annual meeting this week and reported a very prosperous year. The following officers were elected: J. S. Newberry, president; S. W. Utley, vice-president and general manager, and F. P. Warren, treasurer.

The Lake Shore Railroad will spend about \$100,000 in the city of Kalamazoo, Mich., for improvements. The

Chicago

CHICAGO, ILL., May 16, 1911.

Although most branches of business are extremely quiet an improvement is noted in the Chicago machinery market. Small floor sales emanating from a variety of sources have been extremely active. Inquiry has been very good. Among the most recent machinery lists issued are those of the United States Reclamation Service and the Rock Island Arsenal. The Reclamation Service business will amount to about \$6,500 and that of the Arsenal, which closes June 6, to about \$5,000. The Santa Fé Railroad is reported to be closing its business on a recently issued list which totals between \$10,000 and \$12,000. Other railroad activity in this market seems assured for the immediate future, as in all probability the Northwestern will purchase between \$30,000 and \$40,000 worth of machine tools and the Illinois Central a good sized quantity within the next week or two. The leading harvester industry and one of the large electrical companies of this city have been fairly liberal purchasers during the week. The Milwaukee Electric Railway & Light Company is out with a fair-sized list which will be closed in the near future.

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list includes the purchase of a site for the building of a new freight depot and the erection of a good-sized repair shop.

The huge deposits of limestone in Presque Isle County are to be utilized on a large scale by a number of promoters. A New York syndicate, with a capital stock of \$2,000,000 will spend about \$300,000 on steam shovels and stone crushers. A cement plant and sugar beet factory are among other industries planned. Particulars can be had from the Detroit & Mackinac Railroad, which is laying about 14 miles of track for the syndicate.

The Miller Grain Company, with large elevators at Vassar, Mich., suffered from fire the past week to the extent of \$14,000, partly covered by insurance.

Several Emmet County men are preparing to establish a woodenware plant at Munising, Mich. They are L. W. Beebe, of Kalkaska; Milton Bonz, of Alanson, and C. D. Panghorn, of the same city.

Charles Clark, Adrian, Mich., will take over the plant of the Adrian Basket & Veneer Works, which has been quiet for some months. The plant will employ about 100 men. The purchase does not take over the old machinery, as new equipment will be purchased.

The Hancock Mfg. Company, Charlotte, Mich., which for some time has been contemplating removal to another city, in view of crowded conditions, has decided to remain and will start immediately the construction of a new plant nearly double the size of the present factory.

Negotiations were completed this week whereby the erection of a charcoal iron furnace will be started within two weeks at Wells, Mich. The Stephenson Charcoal Iron Company has been organized with a capital stock of \$200,000. The furnace will be of a capacity of seventy tons per day and will be built adjoining the main plant of the Mashek Chemical & Iron Company. The principal stockholders are U. S. Senator Isaac Stephenson and C. H. Schaffer, of Marquette.

The Michigan Condensed Milk Company, Jackson, Mich., has completed the foundation walls of its 60 x 60 ft. addition. Two floors are to be added. New machinery of the latest types will be purchased and present machinery will be overhauled.

A three story brick factory building will be erected by the Hillsdale Screen Company, Hillsdale, Mich., this summer. Material has been ordered for the construction and the contract will soon be let. The factory is to cost in the neighborhood of \$12,000.

Minor S. Keeler and C. Norman Webb are the principal stockholders of the Keeler Brass Company, recently organized at Grand Rapids, Mich., with a capital stock of \$200,000.

The Grand Rapids Refrigerator Company, Grand Rapids, Mich., is engaged in the erection of a good sized addition to its plant.

The Beckwith Estate, manufacturer of stoves and warm air furnaces, Dowagiac, Mich., is engaged in making numerous improvements to its plant, including the construction of a large addition to the main building.

The Wolverine Roofing Company, Saginaw, Mich., has voted to make an increase in its capital stock for needed improvements.

Indianapolis

INDIANAPOLIS, IND., May 16, 1911.

The Sanitary Ventilating Window Company, Indianapolis, has been incorporated with \$250,000 capital stock. The directors are Oran Perry, Howell Waddle, W. H. Burton, R. E. Springsteen and G. H. Rehm.

The Lafayette Electric & Mfg. Company has been incorporated at Lafayette, Ind., with \$200,000 capital stock, to manufacture electrical appliances. The directors are A. E. Scheithe, W. M. Baker and B. P. Shearer.

The Orton-Steinbrenner Steam Shovel Works, Huntington, Ind., though in operation only three weeks, is already making plans to double the size of the plant. Orders are in hand sufficient to keep the factory running until January 1.

The South Bend Chandelier Company has been incorporated at South Bend, Ind., with \$8,500 capital stock, to manufacture chandeliers and other articles of metal. The directors are Albert Listenberger, Louis P. Teuscher and Adam S. Teuscher.

The Elmer Auto Corporation, Elkhart, Ind., has

been incorporated with \$700,000 capital stock, to manufacture automobiles. The directors are H. H. Elmer, H. H. Murden and J. P. O'Shaughnessy.

The Vincennes Tractor Company, Vincennes, Ind., has been incorporated, with \$50,000 capital stock, as manufacturer of engines. The directors are F. L. Oliphant, Edward Watson, Charles Bierhaus, B. F. Nesbitt, R. M. Robinson, W. M. Alsop and J. N. Dyer.

The Superior Flour-Spar Company, Evansville, Ind., has been incorporated with \$50,000 capital stock. The directors are P. Y. McCoy, H. D. Moran, J. W. Waggoner, R. F. Taylor, Roy Griffith, J. B. Blackman and F. M. Fowler.

The American Automobile Mfg. Company, chartered in Arizona, with \$1,000,000 capital stock, has been certified for operation in Indiana, its offices being in New Albany. Its investment in Indiana is given at \$300,000. Its directors are H. K. Cole, Powell McRoberts and A. C. Davis. Berton B. Bales is president of the company.

The Iowa Pump & Silo Company will establish a pump and silo plant in Indianapolis, L. M. Rich and T. C. Munger, of Des Moines, having obtained a lease on a factory building. The Iowa factory owned by the company has been sold.

Alvin Johnson, Greenfield, Ind., and W. R. Rafferty and E. R. Sisson will establish a plant in that city for the manufacture of small refrigerators for automobiles.

Thomas Warner, of Muncie, formerly of the Warner Gear Company of that city, is erecting an automobile parts factory at Toledo, Ohio, and is enlarging a similar factory in Muncie in which he is interested.

The Hardsogg Mfg. Company, Evansville, Ind., has been incorporated, with \$30,000 capital stock, to manufacture mining tools. The directors are Martin Hardsogg, C. R. Anderson and M. P. Duffield.

The Evansville Store Fixture Company, Evansville, Ind., has increased its capital stock from \$10,000 to \$50,000.

The shovel department of the Indiana Rolling Mill Company, Newcastle, Ind., was burned May 9, causing \$200,000 loss. The office and a large warehouse, stocked with handles, were also destroyed. The fire started in the acid section of the finishing department. The company carried \$72,000 on the building burned. The part of the plant destroyed will be rebuilt.

The Remy Electric Company, Anderson, Ind., has purchased the interests and patents of the American Electric Headlight Company, Indianapolis, and the plant will be consolidated with that of the Remy Company after the erection of additional buildings.

The Miller & Donahue Lumber Company's plant, South Bend, Ind., the largest in northern Indiana, has been sold to John W. Paxton for \$37,125. The company failed recently with liabilities of \$325,000. The property was appraised at \$72,000.

Edward O. Hopkins, formerly connected with the Sloss-Sheffield Steel & Iron Company's plant at Birmingham, Ala., has been elected president of the Indiana Tie Company, Evansville, Ind.

A company to be known as the Vincennes Gas Tractor Company is in process of organization at Vincennes, Ind. It will be incorporated with \$50,000 and will manufacture gasoline and kerosene tractors and large stationary gasoline engines. The enterprise is being promoted by J. M. Dyer, and an existing plant will be utilized for manufacturing purposes.

St. Louis

ST. LOUIS, MO., May 15, 1911.

The Dorris Motor Car Company, St. Louis, advises that it will erect a new plant within the coming year.

The Acme Hoisting Machine Company, St. Louis, has been incorporated with \$50,000 capital stock. The company will manufacture a combination concrete and brick hoisting machine for use in building operations. George S. Cornell, 4149 West Bell place, St. Louis, is president of the company.

The Wrisberg Mining & Milling Company, St. Louis, has been incorporated with a capital stock of \$60,000. The incorporators are W. C. Wrisberg, Charles G. Wrisberg, Edward F. Wrisberg and others.

The new plant of the St. Clair County Gas Company at Nineteenth street and Lynch avenue was damaged by fire May 9 to the extent of \$2,500.

The Victor Iron & Furnace Company, St. Louis, has been incorporated with a capital stock of \$50,000. The incorporators are William H. Ballmann, William A. Chambers, L. W. and M. L. Brown and G. L. Graham.

THE MACHINERY MARKETS

The Holbrook-Helicopter Aeroplane Company proposes to build a factory at Monett, Mo. The company is composed principally of Monett citizens.

Ellis D. Munger, 850 East Walnut street, Springfield, Mo., and J. Neff, of the Berryville Milling Company, Berryville, Ark., have closed a deal for 20 acres of land in the White River near Grand View, where they intend to locate a hydroelectric power plant to develop 2000 hp. The estimated cost of the undertaking is \$75,000.

E. Becker, a Milwaukee capitalist, has purchased a lease on the North Pole mine, near Carthage, Mo., and will erect a 250-ton mill which will cost upward of \$20,000.

An organization has been formed at Plevna, Kan., to build and operate a farmer's cooperative elevator. The following officers were elected: President, S. C. Davidson; secretary, P. T. Snyder; treasurer, George N. Pew.

The Commercial Club of Tulsa, Okla., has just executed a contract with the Oklahoma Iron Works to construct a foundry in that city.

Sand Springs City, Okla., is planning to install electric lighting and water works.

The Union Iron & Steel Company, Sapulpa, Okla., has been incorporated with a capital stock of \$1,000,000. The directors are S. R. Wells, W. C. Wells and W. A. Borah.

S. B. Dunbar, Oklahoma City, has been awarded the contract to build the power plant at the State penitentiary at McAlister, Texas, to cost \$25,000; also a cold storage plant with 32-car capacity. The power plant will furnish lighting and heating for all the penitentiary buildings.

The Imperial Steel & Iron Company, Oklahoma City, Okla., has been incorporated with a capital stock of \$100,000. The incorporators are Mora C. Clark, E. H. Dorsey, E. J. Deupree and others.

The North Arkansas Power Company, Berryville, Ark., will construct on the White River, near Grand View, Ark., a hydroelectric power plant, for which it will be necessary to construct a concrete dam 300 ft. long and drive a tunnel 180 ft. through solid rock. The tunnel and dam will give a 28-ft. head of water and shorten the river two miles. Bids will be asked about August 1 with the expectation of commencing work by September 1.

Nowata, Okla., will award a contract for the installation of a water works system, for which bonds in the sum of \$75,000 have been voted. The contract will include two 125-hp. boilers, two pumps.

A petition is in circulation at Upland, Neb., asking for a special election to be called for the purpose of voting bonds in the sum of \$10,000 for the installation of a water works system.

The South

LOUISVILLE, KY., May 16, 1911.

Business generally is quieter in the local market than it has been, this condition applying especially to power equipment. There seems to be plenty of prospects, but the volume of business which is being closed is not altogether satisfactory. Weather conditions have steadied considerably, and this is expected to cause an improvement. Quarry machinery manufacturers, who have been having a fair trade, report that the demand has subsided considerably. There appears to be a good call for refrigerating equipment.

The Northern Engineering Works, Detroit, Mich., has been given the contract for the erection of a 40-ton crane in the plant of the Kentucky Electric Company, Louisville. It will have a 5-ton auxiliary hoist and will be operated by four 3-phase alternating current motors.

The Henry Vogt Machine Company has contracted for the delivery of a 125-ton refrigerating machine to the Texas Company, Port Arthur, Tex.

Officials of the Louisville & Nashville Railroad have stated, in reference to the report that the new shops of the company at Boyles, Ala., are to be placed in operation in the immediate future, that the shops are still far from completed, and that it will be several months before operations can be begun there.

The Brinly-Hardy Company, Louisville, manufacturer of plows, will erect a new foundry building adjoining the present plant at Preston and Main streets. The present foundry will be turned into an extension of the forging department. New equipment for both parts of the plant will be required.

James Clark, Jr., president of the James Clark, Jr.,

Electrical Company, has returned from a trip to the Pacific Coast, taken in company with a number of other business men. He said that business on the coast is generally quiet, Portland, Ore., being the only city where conditions are regarded as active.

It has developed that the plans for the organization of the Western Steel & Iron Company, which was to have located a plant at Pittsburg, Kan., for the manufacture of bar iron, have not been carried out, and its future is rather indefinite. The equipment of the Louisville Bolt & Iron Company, which was to have been transferred to the mill of the new company, is still intact.

E. D. Morton & Co., Louisville, report sales of screw conveyors manufactured by the Weber Mfg. Company and several Williams feed water regulators. The company has secured the agency for the line of the Howe Scales Company, Rutland, Vt., including scales, trucks and safes.

The Hydraulic Brick Company, Louisville, is installing some new equipment, including conveyors of the Jeffery Company. They are operated by steam.

The Board of Public Works of Louisville, of which M. W. Neal is chairman, is considering the reconstruction of an abandoned garbage reduction plant and equipping it for use.

Adolph Mueller, Louisville, has perfected an improved screw for use on ocean steamships. It is likely that the manufacture of it will be arranged for.

The Wood-Stubbs Company, Louisville, which is erecting a new warehouse, will require machinery for the sorting of seeds, including sifters, etc.

The Independent Quarry Company, Louisville, is in the market for an air compressor.

The improvements on the waterworks plant at Somerset, Ky., include the addition of a new pump. J. L. Waddle is general manager of the United Water, Light & Traction Company, which operates the plant.

The L. M. Booth Company, Columbus, Ohio, has been awarded the contract for the equipment which is to be installed in the new water plant at Owensboro, Ky.

The Nortonville Traction Company, Nortonville, Ky., of which Frank E. Mohr is president, will begin the construction of its electric railroad within the next month. Its power plant will be located at Nortonville, and arrangements will be made to develop a lighting service as well. The capital stock of the company is \$100,000.

The Kentweva Coal & Lumber Company, Elkins, W. Va., has filed a charter providing a capital stock of \$500,000. It will develop coal properties in eastern Kentucky. Charles S. Robb, W. A. Pugh and others are the incorporators.

The fiscal court of Meade County, Ky., with headquarters at Brandenburg, will probably purchase a road roller and other road-making equipment.

The Capital Gas & Electric Company, Frankfort, Ky., is installing additional equipment and will practically double the capacity of the plant.

The fiscal court of Henderson County, Ky., has closed a contract with the Vincennes, Ind., Bridge Company for the erection of six steel bridges, the cost of which will be \$9,720.

F. N. Bradford and B. F. Jewell have taken over the Home Steam Laundry at Glasgow, Ky., and will install additional machinery.

The hydroelectric plant of the Watauga Power Company, located on the Watauga River, near Elizabethton, Tenn., will be completed within the next three months. The power will be transmitted to Bristol, Tenn., where it will be used by the Bristol Gas & Electric Company.

Contracts have been let for the construction of the new sawmill of the McLean Lumber Company, of Chattanooga, Tenn. The woodworking equipment will be furnished by the Chattanooga Machinery Company, while the engines will be built by the Wheland Machine Works, Chattanooga. Boilers will be installed by the Casey-Hedges Company, of that city.

J. F. Boyd, D. D. Hicks and their associates have purchased power rights at Manchester, Tenn., and will develop a hydroelectric power plant. A franchise to furnish the city with electric lights will be asked for. A dam is to be built at once.

A cottonseed oil mill is to be built by the Madison Cotton Oil Company at Jackson, Tenn. James L. Talbot is superintendent of the company.

An addition to the factory of the Brock Candy Company, Chattanooga, Tenn., is to be built. The contract for the building has already been let.

THE MACHINERY MARKETS

Machinery is to be installed by the Hollow Handle Hoe Company, Hope, Ark., which has completed the erection of its factory building. Address L. A. Sandoe.

The plant of the Mobile Stove & Pulley Works, of Mobile, Ala., which was destroyed by fire recently, is being rebuilt. The mounting department building is now going up and plans will be completed shortly for the main building. New machinery will be installed throughout.

The Booneville Oil & Gas Company, Booneville, Ark., is considering the construction of a water works system and a gas plant. A franchise has been applied for.

The Central Cotton Oil Company, Jackson, Miss., is asking for prices on a second-hand 220-volt generator of 150 hp.

The Louisiana State University at Baton Rouge is in the market for a refrigerating plant. Address R. L. Himes.

Wayne Young, Mena, Ark., wants quarrying equipment consisting of air drills, compressors, crushers, hoist, pumps, etc., as well as power equipment.

W. M. Johnson, president of the Louisiana Stave & Heading Company, is considering the erection of a stave mill at Monroe, La.

The Edge-Dowling Lumber Company, Taylorville, Fla., has announced that it will rebuild the plant recently destroyed by fire.

The Southern Gasoline Engine Company has been incorporated at Spartanburg, S. C., with \$15,000 capital stock, for the manufacture of gasoline engines for agricultural, stationary and marine use. A shop is being equipped and the company is in the market for a hobbing machine for spiral gears. W. F. Robinson is president and W. D. Wilcox vice-president.

The Board of Water and Light Commissioners, Concord, N. C., will receive bids until May 31 for building an auxiliary pumping station, furnishing turbine pumps and motors, cast iron pipe, etc. Plans and specifications are on file at the office of the engineer, Gilbert C. White, Durham, N. C.

Western Canada

WINNIPEG, MAN., May 12, 1911.

An agreement has been entered into by the city council of Port Arthur, Ont., with J. L. MacRae for the construction and operation by a company he represents of a hard wood finishing plant to cost not less than \$60,000, the city to guarantee bonds for \$35,000.

An arrangement has been approved by the Dominion Government whereby the \$200,000 subsidy to the V. W. & Y. Railway Company for the building of a bridge at the Second Narrows, near Vancouver, B. C., will be transferred to the Burrard Inlet & Tunnel Company, Vancouver, which corporation is to build the bridge, the railroad company to build the approaches. Funds are also voted for this bridge by the British Columbia Legislature and by the cities of Vancouver, North Vancouver and adjacent municipalities. Plans of the bridge are at once to be filed with the Board of Railway Commissioners, Ottawa.

The Polson Iron Works Company, Toronto, is forwarding to Nelson, B. C., material for the construction at the Fairview shipyards there of a steel barge for the Canadian Pacific Railway Company. The barge will be the first made of steel to be floated on the lakes of the Kootenay district. A foreman and 20 hands have been sent from the Polson works in Toronto to put the vessel together.

Gorman, Clancey & Grindley, Calgary, Alberta, have secured for the United States Steel Corporation the contract for rails and specials to be used in the construction of the Moose Jaw street railroad system.

The Western Canada Cement Company has been incorporated as a provincial company, with headquarters at Edmonton, Alberta, and a capital stock of \$1,500,000. Lieutenant-Governor Bulyea is chairman of the company's board of directors.

The Port Arthur Trades and Labor Council is opposing the project to establish in the city a factory for the making of phosphorus matches.

The Tyee Copper Company, Ladysmith, B. C., proposes to instal a converter to turn out blister copper.

The Calgary City Council offers the Calgary Stove & Furnace Company site for a factory at cost.

The Canada Cement Company has purchased a site of 100 acres near Winnipeg, on which it intends to place a cement-grinding plant to cost \$400,000.

The Canadian Pacific Railway Company has laid be-

fore the municipal council of Coquitlam, B. C., plans for repair shops and yards to be established there. The plant is to be an immense one. About 90 miles of track will be laid for yard purposes.

Sealed proposals for an incinerator plant will be received by W. F. Heal, city clerk, Moosejaw, Sask., up to May 22.

Eastern Canada

TORONTO, ONT., May 13, 1911.

Excellent reports are given as to the state of business. Labor is fully employed and the government has temporarily let down the bars for immigrants coming, not directly from native land or country of adoption, but immediately through another country. This is found necessary because of labor shortage on construction contract account. The Canadian Northern Railway Company is to be assisted in the financing of the construction of the 1,000-mile section between Port Arthur and Montreal by a Dominion government bond guarantee of \$35,000 per mile. Immigration will this year distance all previous records, as many as half a million newcomers being expected. There is a demand for money rather in excess of supply.

The Dominion Power & Transmission Company, Hamilton, Ont., is making a large addition to its generating plant at Decew Falls. The capacity of that plant will be increased from its present limit of 38,000 hp. to 60,000 hp., and 200 ft. will be added to the penstock.

The Massey-Harris Company, farm implement manufacturer, Toronto, is arranging to enlarge its plant in Brantford, Ont.

It is announced that work will be commenced shortly on the great plant to be built at Welland, Ont., for the Deere Plow Works. A site of 250 acres has been purchased and the Dain factory in Welland has been acquired for the company.

By-laws to aid projected local industries by small loans have been approved by the ratepayers of Owen Sound, Ont. Lake & Wood are to establish a knitting factory; a furniture factory is to be put up by Toronto parties; C. S. Lloyd & Co., Toronto, are to build a factory in which to make children's carriages.

Fire damaged the testing department of the Allis-Chalmers-Bullock Company's plant in Montreal, near Lachine, to an amount variously estimated at from \$50,000 to \$100,000. The loss is covered by insurance.

The city council of Guelph, Ont., has passed a by-law authorizing a loan by the municipality of \$20,000 to the Independent Tire Company, Toronto, for the establishment in Guelph of a factory to cost \$50,000.

S. L. McKay, Sarnia, Ont., is negotiating for the supplying of natural gas from the Tilbury field to the city of London, Ont. The aim is to use the city gas company's mains for the local distribution of the gas. Twenty-five miles of the 78 miles of pipe required are already laid. It is estimated that it will cost \$800,000 to lay the total 12-in. line.

The Canadian Detroit Lubricating Company is the name of a concern that is about to start operations in Windsor, Ont.

Representatives of the Crumback Motor Company, Detroit, are endeavoring to interest investors in Brantford, Ont., in a proposal to establish there a plant for the manufacture of motor cars. The capital stock would be \$100,000.

The Fire Committee of the City Council of Guelph, Ont., has recommended the purchase of a combination hose and pump automobile to cost about \$9,000.

The Grand Trunk Railway Company has advised the city council of Montreal that its plans for station accommodation there and other works, including track elevation will call for an outlay estimated at \$9,419,000. The cost of the station is to be \$3,210,751, and of other steel work, \$539,172. The city is to contribute \$2,000,000.

Tenders are called until May 22 for the supply of 280 tons of 8-in. cast iron water pipe for Lachute, Que. J. W. Raitt, town clerk.

Up to May 23 the Mayor of Toronto will receive tenders for the supply of 3,500 ft. of steel pipe, 72 in. in diameter, for waterworks intake purposes.

The Dominion Metals Company, Ltd., now located on Dufferin street, Toronto, is selling its plant in that city and moving to Welland, Ont., where it has secured a site and will erect a thoroughly up-to-date silver and gold smelting and refining plant. John N. Lake is president of the company.

THE MACHINERY MARKETS

Texas

AUSTIN, TEXAS, May 12, 1911.

An unusually large number of industrial enterprises are reported from different parts of Texas and the Southwest. The business situation shows a general improvement. In Mexico the restoration of peace is expected to result quickly in a great revival of various kind of industries, particularly mining. Many orders for new mining machinery and other plants are being held up pending a settlement of the interior troubles.

The Granger Oil Mill Company is installing a 30-ton ice factory at Granger. The water supply will come from an artesian well that is flowing 350,000 gal. per day.

The Elkins Mattress Mfg. Company, El Paso, will install a mattress factory at Flatonia. J. L. Elkins is at the head of the project.

The San Benito Sugar Mfg. Company has commenced the erection of a 1200-ton sugar mill at San Benito. Stanley S. Dudds, of Proctor, Vt., has charge of construction.

C. D. Webster, of Orange, is at the head of the Webster Refining Company that has just been organized with a capital stock of \$25,000 to erect an oil refinery at Mooringsport, La.

Dubney White will install a modern cotton gin and other manufacturing plants at Tyler.

The City Council has granted a franchise to Henry M. Wallace and Raymond G. St. John, Detroit, Mich., for the installation of a gas plant and the construction of a distributing system at Waxahachie, Texas. The rate for gas is fixed at \$1.65 per 1000 ft. The franchise is for a period of 30 years.

The Central Mfg. Company, which has taken over the brick plant and clay deposit of the Prewitt Brick Company near Elgin, will enlarge the works and expand the business in other respects.

The Board of City Commissioners of Waco has decided to call an election at some future date to vote on the proposition of issuing \$80,000 of bonds for the construction of extensions of the sewer system.

The Waco Land, Mining & Fuel Company is arranging for installing machinery and making other improvements to its lignite property that it will open up near Teague. W. M. Foster, of Waco, has charge of operations.

R. W. Warren and associates will install an electric light plant, an ice plant and a steam laundry at Knox City.

W. C. Bondzieher will install a sawmill at Chriesman.

Bonds have been issued for the erection of two bridges across the Brazos River in Fort Bend County to cost about \$30,000 each.

The Temple Gas Company has approved plans for the rehabilitation of its gas plant and distributing system at Temple. The work will be started immediately and it is expected that the plant will be ready for operation in about six months. P. L. Downs is president.

The City Council of Temple has just granted a franchise to Henry M. Wallace and Raymond G. St. John, of Detroit, Mich., for the installation of a gas plant and distributing system. It is required that the construction works shall be started by July 1 and be finished within one year from that date.

A number of business men of Bellville have joined in a movement to erect a cotton seed oil mill there. The cost of the proposed plant will be about \$30,000, that amount of stock having been subscribed to the company that is being organized.

The City Council is arranging for the installation of an electric light and power plant at Rosenberg.

The Pearland Canning Company, which has just been organized, will build a fruit and vegetable canning factory at Pearland. C. R. Richey is president.

W. L. Green and associates will establish a cotton gin at Citrus Grove.

E. H. Young, Galveston, is erecting a large cotton seed meal grinding plant at Texas City. It will have a capacity of 500 tons of meal per day and will be the largest plant of its kind in the United States, Mr. Young says. The machinery will be housed in a building 100 x 400 ft., of frame construction, with corrugated iron sides and concrete foundation and will be operated by individual electric motors. The Texas City Transportation Company will construct two miles of track and sidings to connect the proposed plant with its terminal system.

The West Side Farmers' League has just been organized at Carlsbad, N. M., for the purpose of aiding

in bringing about an enlargement of the Carlsbad irrigation project. The proposed work involved the construction of a third reservoir that will have a storage capacity equal to both of the present reservoirs at a cost of about \$700,000, the cementing of a portion of the present canal at a cost of about \$300,000 and the installation of a pumping plant to lift the water into a higher canal in order that a scope of upland may be irrigated. The officers of the new organization are: President, W. H. Merchant; vice-president, Samuel Hughes; secretary and treasurer, Charles P. Jones, all of Carlsbad.

The Spring River Power Company, recently organized with a capital stock of \$100,000, will install hydro-electric plants on Spring River in Arkansas and construct power transmission lines to a number of towns. The main offices of the company are at Jonesboro, Ark. F. R. Land is president, J. D. Brown, secretary, and W. H. Vaughan, treasurer.

The first steps looking to the creation of an irrigation district that will embrace 180,000 acres of land have been taken by the taxpayers of the Raymondville section in the lower Rio Grande Valley, and the formal petitions asking that an election be held in the proposed district to vote on the proposition of issuing about \$3,000,000 of bonds for the construction of a gigantic canal system, ditches and the installation of the necessary pumping machinery will soon be presented to the commissioners' courts of Cameron and Hidalgo counties out of which the district is to be created.

Allen & Riche, Brownsville, Texas, are looking after the details of the new irrigation district proposition.

It is announced that the Consolidated Mutual Reservoir Company, of Grand Falls, will soon award contracts for the construction of three large reservoirs for storing water for irrigation purposes. It is estimated that the construction of these reservoirs will involve the handling of more than 700,000 cu. yd. of earth and that their cost will be more than \$250,000. This company recently acquired all the holdings of the Grand Falls Mutual Irrigation Company, the Big Valley Irrigation Company, and the Grand Falls Lake & Irrigation Company, all situated in the western portion of the State. The main canals of the consolidated company, leading from the Pecos River, will be greatly enlarged. Considerable dredging and other machinery will be required for the proposed work.

The Southern Hay Press Mfg. Company is now dismantling its plant at Silver Creek, Miss., preparatory to removing to Houston, having secured a suitable site on the ship channel for the erection of factory buildings, four in number.

William Harbenck is erecting a cotton gin plant at Midway, with a capacity of 50 bales of cotton per day.

J. Rugeley, Bay City, Texas, will erect a modern cotton gin plant to cost upward of \$8,000, including a storage room.

J. L. Vought, Georgetown, will build a modern cotton gin, to cost upward of \$7,500.

Gordon Hill, Harlingen, will erect a cotton seed oil mill and cotton gin.

The Texas Handle Company, Houston, has been incorporated with a capital stock of \$25,000. The incorporators are C. B. McClamroch, E. J. Coar and Dr. E. L. Coar.

The Pacific Coast

PORTLAND, ORE., May 9, 1911.

While no especially large inquiries are coming out, small orders are being received from machine shops all over the north Pacific Coast, and the aggregate volume of business appears to be somewhat greater than that of a year ago. There is a good movement of tools of fairly large capacity for this territory, which requires very little of the heavy equipment used in many of the Eastern shops, the majority of the business being in small tools. Most shops are normally busy, few of them having any unusual rush of work on hand.

The demand for woodworking machinery continues on about the same scale as for some time past. Many mills have been slow in starting operations for the summer, but a number of them are now being overhauled, and there is some inquiry for machinery for new plants.

Mining machinery continues in active demand. A number of large orders have been placed recently by Alaska mining interests, and deliveries are rapidly going forward through Puget Sound ports. Reports from the Orient indicate prospects of a material increase in

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the exportation of machinery in that direction in the next few years. Projects are under way for the development of large mining properties in Korea, for which American machinery will probably be used, and a number of heavy shipments of implements and harvesting machinery have already been sent to Manchuria and eastern Siberia.

Implements and farm machinery are now in strong demand through eastern Oregon and Washington and in Idaho, and the market for irrigating pumps is increasing rapidly. An increase is also noted in the inquiry for road machinery, rock crushers, etc., and numerous orders are being placed for general contractors' equipment, though these include but few large items. Several new inquiries are coming out for electrical and hydro-electric machinery, and an unusually active season in this line is expected.

Bids have been received by the government engineers for installing oil burners in the dredge Clatsop, the lowest figure being \$23,850, submitted by the Vulcan Iron Works. All bids were considerably higher than the estimate.

Contracts have been let for the erection of new car shop buildings for the Oregon & Washington Railroad in this city.

The city of Portland will receive bids May 25 for pumping machinery and boilers for a new fireboat.

Bids have just been received at Olympia, Wash., for an air lift pumping plant for the Washington penitentiary, Walla Walla.

The city of Seattle, Wash., is working on a project to build an auxiliary hydro-electric power plant on Lake Union.

Polk county, Ore., has placed an order with Beall & Co., of this city, for a No. 2 Aurora crusher, a 32-ft. elevator, gasoline roller, trucks, etc.

The Burns Flour Mill Company, Burns, Ore., is planning to replace its power plant with a hydro-electric outfit.

Contracts were recently let for the new power station of the Olympic Power Company, near Port Angeles, Wash.

The Moran Company, Seattle, Wash., has taken a contract for alterations to the steamer Seward, amounting to about \$40,000.

It is reported that the Spokane Lumber Company, Spokane, Wash., is preparing to erect a band-saw mill at Diamond Lake.

I. A. Boynton is preparing to install a planing mill at Kennewick, Wash.

The Union Woollen Mills Company, Washougal, Wash., is considering the installation of a large mill at Bend, Ore.

The Western Cooperage Company, with offices in this city and a large stave mill at Aberdeen, Wash., is about to open up a new timber tract near the Columbia River, for which considerable equipment will probably be required in the near future.

The report of the transfer of the Risdon Iron Works property at San Francisco to the United States Steel Corporation interests is followed by several rumors regarding the prospect of similar transactions in Portland and Seattle. It is reported that representatives of the corporation have recently taken an option on 700 ft. of river frontage in this city, and also that negotiations are in progress for the Morgan Company's plant at Seattle, Wash.

The government engineers are preparing plans for two dredges to be used in deepening the channel of the Sacramento River near Rio Vista, Cal.

Material abandoned by the Atlantic, Gulf & Pacific Company, including a locomotive crane, ore cars, machine tools, etc., will be sold at the Mare Island, Cal., Navy Yard, bids to be opened June 2.

The Western Tool & Mfg. Company, recently incorporated at Oakland, Cal., by W. A. Sturgeon, J. H. Rackerby, J. W. Howard and A. J. Sturgeon, is preparing to start a factory in that city.

The United States Laundry Company is preparing to establish a new plant in this city.

The Oro Rico Mining Company, operating near Coulterville, Cal., has placed an order for a 20-stamp mill.

The California Corrugated Culvert Company, Berkeley, Cal., expects to make a large addition to its factory this summer.

According to a report from Vallejo, Cal., steam turbo-generators will probably be installed in several cruisers at the Mare Island navy yard, owing to the high cost of repairing the old engines in connection with the electrical plants.

The Pacific Improvement Company has ordered equipment for a rock crushing plant to be installed in San Roque Canyon, near Santa Barbara, Cal.

The government engineers have let contracts for compressed air machinery to be used in tunnel work near Yuma, Ariz.

The town of Ellensburg, Wash., is preparing to add a 200 kw. generator to the municipal electric plant.

Government Purchases

WASHINGTON, D. C., May 15, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids May 23, under schedule 3540, for furnishing and installing at Charleston, S. C., one molding machine, one rod and dowel machine and one shaping machine.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids June 6, under schedule 3541, for one boring, drilling and milling machine for Mare Island, Cal.

The Quartermaster's Office, Federal Building, Chicago, Ill., will open bids June 15 for furnishing and delivering at Fort Mills, Corregidor, P. I., six 1,000,000-gal. pumps and one overhead crane and automatic device.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids May 31 for two gasoline engines for Norfolk, Va., under schedule 3558.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids May 31, under schedule 3557, for one wood-turning lathe and one surfacing machine for delivery at Charleston, S. C.

Major F. W. Altstaetter, Engineer Corps, United States Army, opened bids April 10 for furnishing and delivering river wall valve jacks, gate engines, gate winches, for dam No. 26, Ohio River, as follows:

Item 1, River Wall Jacks—New Jersey Foundry & Machine Company, New York, \$3,225; H. P. Gazzam Machine Company, Pittsburgh, Pa., \$2,840.50; John Baizley Iron Works, Philadelphia, Pa., \$2,998; A. D. Granger Company, New York, \$4,560; Ellicott Machine Company, Baltimore, Md., \$3,974; Union Foundry & Machine Company, \$3,388.46; Charles Hegewald Company, New Albany, Ind., \$2,639.99; Aetna Foundry & Machine Company, Warren, Ohio, \$2,470; Thomas Carlin's Company, Pittsburgh, Pa., \$2,670; Vermilye & Power, New York, \$3,793; Exeter Machine Works, Pittsford, Pa., \$4,106; Richard Mfg. Company, Bloomsburg, Pa., \$4,320; M. L. Bayard & Co., Philadelphia, Pa., \$2,550; The Fawcus Machine Company, Pittsburgh, Pa., \$3,643; M. H. Treadwell & Co., Lebanon, Pa., \$3,925; J. & J. B. Milholland Company, Pittsburgh, Pa., \$3,151.

Item 2, for Gate Engines—New Jersey Foundry & Machine Company, New York, \$1,530; H. P. Gazzam Machine Company, Pittsburgh, Pa., \$1,696.50; A. D. Granger Company, New York, \$1,852; Ellicott Machine Company, Baltimore, Md., \$1,980; Union Foundry & Machine Company, Pittsburgh, Pa., \$1,537.20; Thomas Carlin's Sons Company, Pittsburgh, Pa., \$1,200; Vermilye & Power, New York, \$1,197; Exeter Machine Works, Pittsford, Pa., \$1,985; M. L. Bayard & Co., Philadelphia, Pa., \$1,350; Mead, Morrison Mfg. Company, Pittsburgh, Pa., \$1,200; J. & J. B. Milholland Company, Pittsburgh, Pa., \$1,600.

Bids were opened April 22 by the Inspector of the Eleventh Lighthouse District, Detroit, Mich., for furnishing two tandem gasoline-driven air compressors for Marquette light station as follows: Chicago Pneumatic Tool Company, \$1800; Fairbanks, Morse & Co., \$3030.

The Bureau of Yards and Docks, Navy Department, Washington, opened bids April 29 for boilers, oil burning apparatus, superheaters, etc., for the United States naval station, Pearl Harbor, H. T. Various alternate bids were received. The bids for the entire equipment in accordance with plan are as follows: E. Keeler Company, Williamsport, Pa., \$67,173 and \$70,839; Charles C. Moore & Co., San Francisco, Cal., \$81,360; B. & W. boilers and Foster superheaters, and \$75,725; B. & W. cross drum boilers, Foster superheaters.

President Plummer says that the Dominion Steel Company, Sydney, Nova Scotia, cannot have ready in less than 18 months the new machinery required to finish in more profitable forms the material now turned into wire rods, and that the merchant mill contracted for last year should be ready by next autumn. The demand for rails is heavy, and a portion of the wire rod tonnage can be diverted thereto, and there is a good demand for billets.

Copper stocks in England and France were reduced from 69,253 tons April 15 to 67,643 tons April 29, according to the report issued by Henry R. Merton & Co., Ltd., London. This reduction more than counterbalanced the increase in copper stocks in the United States from April 1 to May 1.

The National Association of Stove Manufacturers.

The fortieth annual convention of the National Association of Stove Manufacturers was held May 11 and 12 at the Hotel Astor, New York. The attendance was excellent, and many important questions were considered in connection with the stove business. The association is partly educational and partly commercial. It is understood that valuable information collected by the secretary was placed before the members, relating to the stock of stoves in hand, the sales made during the year, the number and value of different kinds of stoves made and sold, factors of cost, etc. A number of papers were read and the discussion on some of them was interesting and spirited.

President William J. Myers made an address giving valuable suggestions. Harvey J. Fuller presented a paper on "Uniformity of Methods," which was a discussion of the desirability of uniform discount, datings, terms, collections, returned goods, traffic regulations, damage claims and limitation of salesmen's trips. W. G. Henry made an address on "Railroad Rates," showing that changed conditions now confront manufacturers.

George H. Barbour suggested the establishment of a traffic bureau in charge of an expert familiar with railroad usages, with the object of protecting the members and the interests of the stove trade generally. His suggestion was approved, and an appropriation of not more than \$3,000 was made for the employment of such an expert.

Frederic W. Gardner read a paper on "Stove Associations;" Charles S. Prizer, on "Neglected Issues;" Frederick Will, Jr., on "The Economic Aspect of Advertising;" J. W. Conchar, on "Training Salesmen;" John J. Fisher, on "Molding Machinery and Appliances, Aluminum Match Plates for Floor Molding, etc."

The election of officers resulted as follows: President, Abram C. Mott, Philadelphia, Pa.; first vice-president, N. H. Burt, Leavenworth, Kansas; second vice-president, R. D. Rennolds, Richmond, Va.; treasurer, W. T. Barbour, Detroit, Mich.; secretary, E. C. Hanrahan, Chicago; executive committee—Frederic W. Gardner, St. Louis; Arthur W. Walker, Boston; Charles A. Du Charme, Detroit; J. H. O'Brien, Cleveland, Ohio; Edward Bowditch, Albany, N. Y., and J. W. Emery, Quincy, Ill. The subject of "Piracy in the Stove Business" was discussed at some length. Appropriate action was taken on the deaths in the past year of James W. Van Cleave, St. Louis; William H. Knowlson, New York City; M. Brayton McKnight, Reading, Pa.; Edward P. Willson, Leavenworth, Kansas; Ralph S. Buck, St. Louis, and Henry Cribben, Chicago.

The association has held its annual meeting in New York for several successive years, but it was decided to make a change in this respect, and a committee appointed to consider the selection of a place for the next convention recommended that it be held in Detroit, Mich., which was adopted.

Westinghouse Turbines and Reduction Gears for a Naval Vessel

Two marine turbines and reduction gears have been finished and shipped by the Westinghouse Machine Company, and are now being installed on the U. S. collier Neptune, a ship of about 19,000 tons. The second outfit was shipped on Saturday, May 13, and put in place in order to permit of official trials of the Neptune in June. These tests are regarded by naval men as of the highest importance because of the use of comparatively small turbines and reduction gears interposed between their shafts and the propeller shafts. It is claimed that the weight of this class of machinery will be less than half of the weight of other turbines having the propellers coupled directly to the turbine shafts or of reciprocating engines, and that, by reason of the higher speed, the turbines used with reduction gears will require, especially for cruising speeds, from 20 to 30 per cent. less steam than is now needed by any of the turbine-driven ships or ships driven by reciprocating engines. It is interesting to add that by means of the control mechanism already mentioned in these columns the man on the bridge can reverse either or both turbines from full speed ahead to full speed astern in less than 15 sec., or in much less time than it now takes to communicate signals from the bridge to the engine

room with other types of control. All steam and exhaust connections are made to the lower half of the turbine and the general construction is such that the steam may be turned directly into the apparatus when cold, and full speed attained in less than a minute.

The Use of Coke-Oven Gas in Open-Hearth Furnaces

The issue of *Stahl und Eisen* for March 2, 1911, contains a short article on the use of coke oven gas in open-hearth furnaces, which criticizes a paper by E. Trasenster published in a French journal. This writer has obtained successful results on a 7-ton furnace. Where coke-oven gas is used the air alone needs to be preheated. The total heat to carry on the operation is obtained from the combustion of the gas, and the reactions in the bath. The heat is partly absorbed by the fluid metal and slag, part is lost through radiation and the rest is removed by the waste gases. The heat taken up by the bath is independent of the method of heating. The radiation loss naturally depends on the length of time of the heat. Trasenster investigates the amount of heat belonging to the waste gases. The analyses of the producer and coke-oven gas are given below:

Producer Gas.		Coke-Oven Gas.	
Weight.	Volume.	Weight.	Volume.
CO ₂ 11.5	7.5	5.6	1.5
CO 22.8	19.3	16.4	6.0
CH ₄ 0.8	1.3	33.8	22.5
H 0.9	12.3	9.8	57.0
N 64.0	59.6	34.4	13.0

If it is assumed that an excess of 6 per cent. of air is necessary for complete combustion, then 1 kg. (2.2046 lb.) of producer gas requires 1.2 kg. (2.6455 lb.) of air. The same weight of coke-oven gas will require 12.9 kg. (28.439 lb.) of air. In the case of the producer gas, one-half of the heat of the waste gases preheats the air, the other half the gas.

The preheating of the gas is necessary in order to obtain a high enough temperature in the furnace, and is therefore of great importance. If the gas were not preheated, then one half of the heat won from the waste gases would be lost up the chimney. With the use of coke-oven gas the relationship is somewhat different. Preheating of the gas is not necessary in order to reach a sufficiently high temperature. By heating the air alone the writer finds a loss of heat of about 7.5 per cent.; then the gas and air mixture is about 92.5 per cent. preheated. Because of this, the fact that there is no preheating of gas necessary when coke-oven gas is used has not the importance that would at first be supposed. Using coke-oven gas, the waste gases pass to the chimney at about 525 deg. C, instead of 450 deg. C. This means, when the weight of the waste gases is considered, an increase in loss of heat of about 16.5 per cent. The weight of waste gases is, however, very different in the two cases, as the following will show:

	Producer Gas.	Coke-Oven Gas.
Heat value of 1 cubic metre....	1024 heat units	3640 heat units
Weight, 1 cubic metre.....	1.09 kg.	0.43 kg.
Heat value of 1 kg.....	940 heat units	8460 heat units
1 kg. gas furnishes waste gases.	2.2 kg.	13.9 kg.
1 kg. waste gases contains.....	427 heat units	634 heat units

If the heat absorption of the bath remains the same in both cases, then, when using coke-oven gas, 33 per cent. less waste gases will pass to the chimney. Even if 16.5 per cent. of the heat in the waste gases is not used, the thermal efficiency is better than with producer gas.

The exchange of heat between the gases and the bath depends, in the first place, on the difference of temperature between them. The theoretical temperatures, however, will be lowered by various factors, such as the difficulty of obtaining the right amount of air and the dissociation of gases at high temperatures, which are difficult to estimate exactly. The results, therefore, notwithstanding the good thermal efficiency obtained in this case, are not altogether favorable.—G. B. W.

The Niles-Bement-Pond Company, whose offices are at 111 Broadway, New York, has removed its warehouse from 30-31 West street to Hudson and Van Dam streets, New York. This applies particularly to the large stock of Pratt & Whitney small tools of all kinds which are sold at retail at the warehouse.

Trade Publications

Power Press Attachments.—The V & O Press Company, Glendale, N. Y. Bulletin No. 6. Pertains to a line of power press attachments which are automatic in action. These are shown as part of the equipment of various types of presses and a short description of the device is given below the engraving. While the attachments illustrated are standard for the most part, the company will modify the regular design or make special appliances to meet the requirements of particular cases.

Incinerator.—The McCall Incinerator Company of North America, Memphis, Tenn. Several circulars. Describe and illustrate different types of incinerator for the disposal of excreta and other wastes of construction and permanent or semi-permanent camps.

Air Compressors.—Thomas H. Dallett Company, York and Twenty-third streets, Philadelphia, Pa. Two bulletins. No. 203 illustrates a line of duplex and compound belt-driven compressors which are made in a number of different sizes. The construction of these machines is shown by half-tone and line engravings and a table of specifications completes the bulletin. No. 204 describes the duplex and compound steam-driven machines and points out their special features, one of which is the use of an automatic regulating and pressure device for governing the amount of power consumed.

Rock Drills and Steam Pumps.—Ingersoll-Rand Company, 11 Broadway, New York City. Three bulletins. The first, No. 4003, relates to the Little Giant drill of this company which is of the dependent valve tappet type. The construction and operation of the drill are covered at length and there are numerous engravings supplementing the text. In the second, No. 4016, illustrations and descriptive matter explain the operation of the Imperial valveless telescope feed hammer drill. Its special features are pointed out and numerous line drawings serve to make the description clear. In both of these bulletins brief specifications and an illustrated list of repair parts are included. Bulletin No. 7004 deals with the Cameron steam pumps. After pointing out the advantages of installing this type of pump and discussing its operation, the various patterns are illustrated with specification tables.

Cinder Cars.—The William B. Pollock Company, Youngstown, Ohio. Pamphlet. Devoted to the improved Berg cinder car which this company builds under patents granted to P. T. Berg. The construction of the car, which has a capacity of 260 cu. ft., is described at length and the engravings show the car in both the carrying and the dumping positions and the mechanism controlling the movement of the cinder pot. *The Iron Age*, March 23, 1911, contained an illustrated description of the car.

Electrical Measuring Instruments.—Weston Electrical Instrument Company, Waverly Park, Newark, N. J. Folder. Calls attention to the different styles of alternating current instruments made for switchboard use which include ammeters, voltmeters, power-factor and frequency meters, synchroscopes and wattmeters. All of these are illustrated and their construction is briefly described.

Pumps.—Geo. E. Dow Pumping Engine Company, San Francisco, Cal. Catalogue. This is the company's 1911 catalogue describing and illustrating a complete line of pumps for all purposes. These include centrifugal and triplex pumps and other types for deep well pumping and direct connected use. A number of tables giving useful information on the friction loss in pipes, conversion factors for changing gauge pressure into head in feet and vacuum in inches to feet suction and the measurement of water are included.

Automatic Tapping Machine.—The Beaman & Smith Company, Providence, R. I. Booklet. Illustrates and describes the Evans' automatic tapping machine for malleable and cast-iron fittings. Four different styles of machine are built for cutting the threads on fittings having two, three or four outlets, bushings, unions and valves. Data on the output of these machines are included as well as a table of brief specifications.

Sheet Metal.—The Edwards Mfg. Company, Cincinnati, Ohio. Catalogue. Size, 10 x 13½ in.; pages, 186. Treats of a very extensive line of metal sheets for building purposes which are made in a great variety of patterns. The majority of these are given full page illustrations and the different parts of the design are listed with prices.

Lathes and Shapers.—The Springfield Machine Tool Company, Springfield, Ohio. Catalogue G. Relates to the complete line of machine tools manufactured by this company. The parts of the lathes are first described with illustrations supplementing the text and this is followed by descriptions of the different tools. These include lathes with and without friction geared heads and with double and plain back gears, triple gearing, single pulley drive and turrets. Space is also given to a shafting lathe, a spindle and axle boring machine and motor-driven engine lathes and shapers. In describing these tools, the half-tone engraving and brief specifications occupy facing pages for the most part. An illustrated description of the 36-in. motor-driven lathe appeared in *The Iron Age*, January 27, 1910.

Milling Machines.—The Ingersoll Milling Machine Company, Rockford, Ill. Bulletin No. 25—I. Shows a line of heavy duty knee type millers in which the vertical and the horizontal spindles can be used either separately or in combination.

Turbo-Generators and Centrifugal Pumps.—Allis-Chalmers Company, Milwaukee, Wis. Two bulletins. No. 1079, superseding No. 1054, illustrates and describes the standard line of Allis-Chalmers turbo-generating sets, which are built in sizes ranging from 300 kw. up. A general description of the operation of the turbine is given, and this is followed by detail descriptions of both the turbine and the generator supplemented by illustrations. The second bulletin, No. 1624, superseding No. 1608, treats of the company's standard single-stage centrifugal pump. The various parts are illustrated and described, and these are supplemented by line drawings showing constructional details and reproductions of efficiency curves and half-tones of different installations.

Black and Galvanized Sheets.—Seneca Iron & Steel Company, Buffalo, N. Y. Catalogue. Size, 4 x 9 in.; pages, 24. Relates to the various kinds of black and galvanized sheets which this company manufactures. These include corrugated and crimped sheets, plain roll roofing, siding of various kinds and different styles of flat and galvanized sheets. Tables giving the various sizes of sheets made together with the weights per sheet and per bundle complete the catalogue.

Electric Machinery and Fans.—General Electric Company, Schenectady, N. Y. Three bulletins. No. 4799 illustrates and describes with considerable detail the various types of both horizontal and vertical shaft alternators manufactured by this company. No. 4806, superseding No. 4719, treats of the various types of electric fans which have been brought out for home, office and restaurant use, and which can be placed on the desk or table or fastened to the wall or ceiling. These fans are made for either alternating or direct current and in various styles and sizes to meet different installation conditions. In addition to the fans a line of small power motors is also listed. No. 4820, superseding No. 4706, pertains to the line of curve drawing ammeters and voltmeters of this company and shows both the switchboard and portable types as well as the different forms of standard charts which can be furnished. The construction of these instruments is described at length, and a table giving the dimensions of the various sizes of instruments completes the bulletin.

Feed Water Heater Valve Timing Gear.—Harrison Safety Boiler Works, North Philadelphia Station, Philadelphia, Pa. Celluloid model. Shows the valve timing gear which is furnished with new Cochrane steam stack and cut-out valve feed water heater and receiver. The action of the valve is clearly illustrated and it is shown that when the heater is cut off from the exhaust steam supply, the separator which forms a part of it continues to furnish a supply of oil-free exhaust steam to the heating or drying systems.

Evaporators and Ammonia Condensers.—The Grinnell Company, 90 West street, New York City. Two catalogues. The first, No. 301, pertains to the line of Reilly multicool evaporators for producing pure water by distillation from sea water or impure natural water. The use of these evaporators on shipboard and in ice and industrial plants is described at length, and there are a number of illustrations showing the evaporators and also suggestive schemes for installing them. The second catalogue, No. 401, describes and illustrates the G-S evaporative ammonia condenser which is said to require only 4 per cent. of the amount of water ordinarily used in pipe condensers and will maintain a low head pressure in extremely hot weather. The construction of this condenser is briefly described and its advantages pointed out.

The New York Machinists' Strike

The strike of the machinists in Greater New York and Hudson County, N. J., for an eight-hour working day has spread to a number of new plants, but the efforts of the committee appointed by employers to fight the strike in conjunction with the National Metal Trades Association have offset this gain, as many of their men have returned to work. Fully 150 employees of the Garvin Machine Company have gone back and other desertions from the union ranks are reported from several shops. The officials of the National Metal Trades Association declare that they have been able to obtain all the labor required. With the exception of two plants, work has been resumed in all of the affected shops. In the case of manufacturers whose plants have not been started up, it is declared that they do not desire to resume immediately, and the Metal Trades officials say that if they wish to begin operations the necessary labor can be obtained.

The nineteenth annual meeting of the Society for the Promotion of Engineering Education will be held at Pittsburgh, Pa., June 27, 28 and 29. The headquarters will be at the Carnegie Technical Schools. At the meeting special attention will be given to the reports of the committees on the teaching of mathematics to engineering students and entrance examinations for technical schools. The secretary of the society is Prof. H. H. Norris, Cornell University, Ithaca, N. Y.

